

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	16956	1	1

**JOB # 31
NORTH DAKOTA**

DEPARTMENT OF TRANSPORTATION

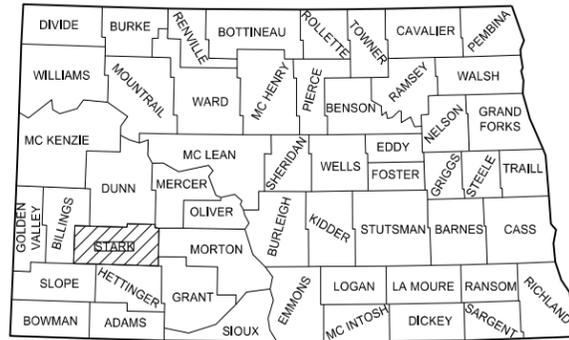
TEU-5-022(115)072
Dickinson Highway 22 Landscape Enhancement Project

FHWA Limited Involvement
Stark County
Tree Plantings

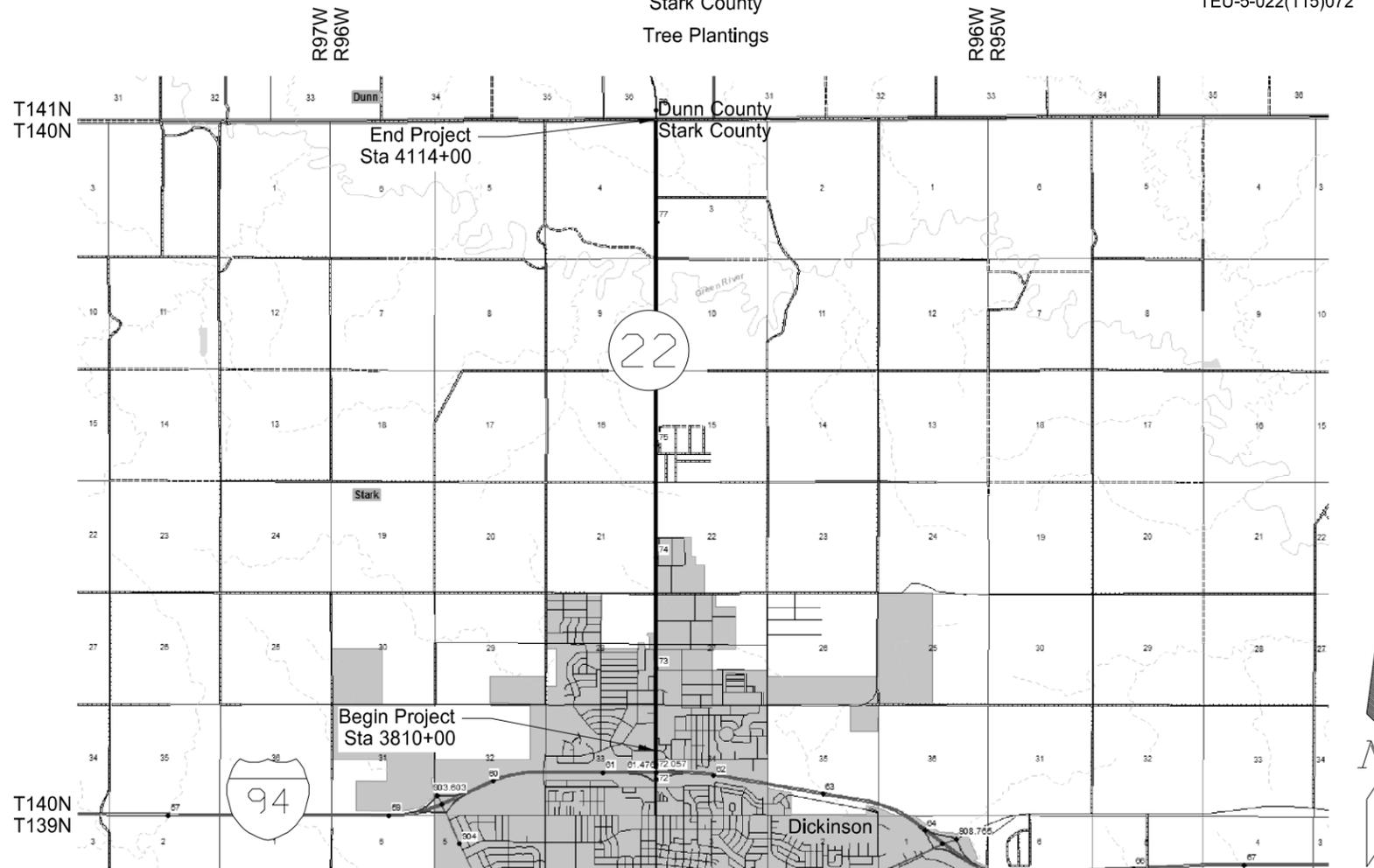
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
TEU-5-022(115)072	5.758	5.758



STATE COUNTY MAP



DESIGNERS

Alexis J. Wallevand, PLA, ASLA



APPROVED DATE August 21, 2013

William L. Watson /s/
CITY ENGINEER
CITY OF DICKINSON

APPROVED DATE August 30, 2013

Bob Fode /s/
OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional landscape architect under the laws of the state of ND.

APPROVED DATE August 23, 2013

Alexis J. Wallevand /s/
ULTEIG ENGINEERS, INC.

This document was originally issued and sealed by Alexis J. Wallevand Registration Number LA- 3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	2	1

TABLE OF CONTENTS

<u>Section No.</u>	<u>Sheet No.</u>	<u>Description</u>
1	1	Title Sheet
2	1	Table of Contents
6	1-6	Notes & Environmental Commitments
8	1	Quantities
10	1	Basis of Estimate
20	1	General Details
85	1-16	Landscape Layouts

LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-20-1-3	NDDOT Abbreviations
D-20-10	NDDOT Utility Company Abbreviations
D-20-20-21	Linestyles
D-20-30-32	Symbols
D-704-7, 8	Breakaway Systems for Construction Zone Signs
D-704-9-11	Construction Sign Details
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign and Barricade Assembly Details
D-704-24	Construction Sign and Barricade Location Details
D-708-2	Erosion and Siltation Controls

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	1

NOTES

GENERAL NOTES

100-P01 **CLEANING:** The Contractor shall be responsible for removing all debris from the existing roadway adjacent to the construction area at the end of each construction day before traffic is returned to normal.

100-P02 **WORK SCHEDULE:** No work will be allowed from 11:00 P.M. to 7:00 A.M unless approved by the Project Manager.

100-P03 **TREES, SHRUBS AND TURF AREAS:** The Contractor shall exercise care in construction operations to ensure that trees, shrubs and grasses adjacent to the project and outside the construction area are not disturbed unless approved by the Project Manager. The Contractor shall not perform any equipment operations within tree drip lines.

100-P04 **CONTRACTOR PARKING:** The Contractor shall not use private property to park vehicles, store materials, or as a work area without written permission from the Owner. The Contractor shall provide any written agreements between the Contractor and a Land Owner to the Project Manager prior to any access. Any damages to private property shall be repaired to the satisfaction of the Owner by the Contractor and at the Contractor's expense.

100-P05 **UTILITIES:** Locations of utilities shown in the plans are based upon the best information available at the time of plan preparation.

100-P06 **WETLANDS:** The Contractor shall not enter any of the wetlands shown in Section 85.

203-P02 **TOPSOIL:** Topsoil shall be imported to facilitate the requirements of all tree planting areas.

Topsoil shall be a fertile loam soil, friable, uniform in texture, and free of any stones, lumps, clods, plants or roots, sticks, wood, and/or other extraneous material. Remove stones larger than one (1) inch diameter. Break up all lumps or clods before backfilling.

Immediately prior to dumping and spreading the topsoil, the surface shall be scarified to a minimum depth of 2 inches to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 1 inch in any diameter and all litter or other material which may be detrimental to proper bonding or the proper growth of the desired planting.

The areas shall be smooth-graded and the surface left in an even and properly compacted condition to prevent, insofar as practical, the formation of low places or pockets where water will stand.

All costs associated with furnishing, hauling, and placing imported topsoil shall be included in the price bid for the plantings on the project.

704-P01 **TRAFFIC CONTROL:** Traffic control shall only be installed in areas where work is in progress. Type S and Type HH on Standard D-704-24 apply depending on operations. The Contractor shall leave the work areas free of all hazards during nonworking hours. The traffic control devices shall be removed at the end of each day and reinstalled when work recommences.

All costs for traffic control items necessary to perform the work shall be included in the price bid for "Mobilization".

708-P01 **SEEDING – Type A – CL II:** All areas, except mulched tree pits, that are disturbed by construction activities shall be reshaped (if necessary) and seeded.

All cost for labor, equipment and materials necessary to complete the work will be included in the price bid of the trees.

900-P01 **EXISTING PROPERTY CORNERS AND ROW MARKERS:** The Contractor shall use special care to avoid disturbing existing property corner or right of way survey markers. If a marker needs to be disturbed by construction, the Contractor shall notify the Project Manager. Failure of the Contractor to cooperate with the Project Manager will result in the Contractor having to hire a registered land surveyor, at his/her own expense, to replace lost markers.

970-P01 **PROJECT PERSONNEL:** The Contractor shall be required to have an International Society of Arboriculture (ISA) certified arborist, a local Commercial Arborist Licensee, or other certified individual that is knowledgeable of plant materials and proper planting conditions on the project. Contractor shall provide proof of current certification to the Project Manager. If the Contractor wishes to submit any other certification for consideration, documentation of equivalent minimum requirements must also be submitted to the Project Manager.

The Contractor shall have a Certified Herbicide Applicator available for the project.

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	2

970-P02 LANDSCAPE SUBMITTALS: The following submittals shall be required for the plant materials.

Pre-construction Conference:

1. Plant Source(s): List of all project plant materials and their sources. Any concerns the Contractor may have regarding the project plant materials including plant material suitability and/or availability should be indicated in writing.
2. Personnel Certifications
3. Proposed Planting Schedule

Submittals prior to plant installation approval:

1. Plant Source Verification: Order confirmation from supplier(s)
2. Certificate(s) of Inspection: As required by governmental authorities

Submittals required for project closeout:

1. Plant Establishment Forms (Inspection Forms submitted with Payrolls)
2. Plant Maintenance Recommendations
3. Plan Record Drawings

970-P03 PLANT SIZES: Contractor shall comply with size and grading standards of the latest edition of "American Standard for Nursery Stock ". All trees up to four (4) inch calipers shall be measured at a point six (6) inches above the ground line. Any plant material which does not meet the specified minimum size shall be rejected. If the Contractor is unable to locate plant material in the specified sizes, negotiation for unit price adjustment and/or a plant substitution shall be concluded prior to shipment from the source.

970-P04 PLANT SUBSTITUTIONS: Plant materials shall be as listed and shall comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. If the specified plant material(s) is/are not obtainable, the Contractor shall submit proof of non-availability from at least three suppliers to Project Manager. The Contractor may then propose a suitable substitution to the Project Manager for review and approval. The substitutions must have similar environmental needs (suitable for the project site), plant form/characteristics, and habit as the plant material(s) specified. The Contractor shall provide comparative outlines of the original plant selection(s) and the proposed substitution(s) to the Project Manager. No substitutions of specified sizes, grades, species, cultivars, qualities, or forms shall be made without written approval of the Project Manager.

Should any field conditions be deemed inappropriate for the specified plant materials, it is the Contractor's responsibility to submit a written proposal for appropriate plant substitutions.

970-P05 SITE CONDITIONS: The Contractor shall notify the Project Manager in writing of any site conditions which the Contractor considers detrimental to plant growth such as chemical residue, rubble fill, clay fill, adverse drainage conditions, obstructions, or the

like. It is highly recommended that the Contractor contact the appropriate state, county, and/or city weed control agencies to assure planting areas are free of chemical residue. The Contractor will be responsible for healthy plant growth throughout the maintenance period without exception.

970-P06 TREE PIT SUBSOIL PREPARATION: Prior to placing topsoil within the tree pits, the Contractor shall rototill a minimum 6" depth within the bottom of the tree pit. The Contractor shall break up large clumps, remove any extraneous material, and re-shape the subgrade prior to placing topsoil. All costs associated with tree pit subsoil preparation shall be included in the price bid for the trees.

970-P07 SOIL AMENITIES: The Contractor shall be responsible for reviewing any soil conditions that may prevent positive plant growth. The Contractor shall provide all soil amendments needed for the planting areas. If any soil amendments are needed for the project, an itemized list of proposed amenities along with all necessary product certificates shall be submitted to the Project Manager prior to use or installation. All costs associated with preparations of planting areas shall be included in the price bid for plant materials.

970-P08 PLANT LOCATIONS: The Contractor shall mark plant material locations as indicated on the plans. Contractor shall obtain approval from the Project Manager prior to planting. If obstructions are encountered that are not shown on Drawings, planting operations shall not commence until alternate plant locations have been selected and reviewed with the Project Manager.

970-P09 PLANT ACCEPTANCE: All plant materials shall be nursery-grown under climatic conditions found at the site for a minimum of one year prior to the contract date. Plant materials shall be vigorous and healthy, and true to name.

Plant materials which lack proper proportions, have serious injuries to the bark or roots, broken branches, objectionable disfigurement, shriveled and/or dry roots, broken balls, insect pests, diseases, or which are not found to comply with the specifications in any way will be rejected. Trees with broken leaders or no upright, dominant single leader will be rejected.

The Contractor shall coordinate with the Project Manager for the initial pre-installation inspection and acceptance of plant materials. Rejected plant material shall be removed from the project site within 24 hours. Any plant materials installed prior to an initial inspection will be rejected and shall be removed from the project site within 24 hours.

970-P10 PLANT LABELS: Each tree, shrub, or perennial delivered to the site shall bear a plant label stating its correct size and botanical name. The tree labels shall be durable, legible labels utilizing weather resistant ink or embossed process. All labels shall be attached in such a manner that will not damage or hinder the growth of the plant to which it is

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	3

NOTES

affixed. After installation of the plant materials all labels shall be removed by the Contractor. One label of each type of plant shall be provided to the Project Manager for the project records.

970-P11 PLANT TYPES: See planting details and plant schedule for additional information.

Balled and Burlapped (B&B): Balled and Burlapped plants shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. The Contractor shall provide ball sizes complying with the most recent edition of the "American Standard for Nursery Stock". Loose, broken, manufactured, cracked, or mushroomed balls are not acceptable.

Container-grown: Container-grown stock shall be dug up with adequate fibrous roots, covered with a uniform thick coating of mud that was puddled immediately after they were extracted, or packed in moist straw or peat moss. Container-grown plants shall comply with the most recent edition of the "American Standard for Nursery Stock". All containers are to be removed prior to backfilling planting pits.

Bare Root: Bare root trees shall have a well branched root system characteristic of the species with a root spread as specified in the most recent edition of the "American Standard for Nursery Stock." All damage, injured, or broken roots shall be cut with a sharp, clean pruning shears leaving no damaged, frayed, or splintered cut surfaces.

970-P12 PRODUCT DELIVERY, STORAGE, AND HANDLING: The Contractor shall take all precautions customary in good trade practice in preparing plants for transport. All plants shall be protected from drying out and all roots shall be protected from exposure to sunlight. If necessary, deciduous plants in foliage shall be sprayed with an approved Anti-Desiccant immediately after digging to prevent dehydration. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice and upon arrival, the certificate shall be filed with the Project Manager.

If plants cannot be planted within the scheduled workload for the day, the Contractor shall properly protect them with soil, wet peat moss, or in a manner acceptable to the Project Manager. Balled and Burlapped, container, and heeled-in plantings shall be watered daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

970-P13 TREE PITS: Tree pits, at their base, shall be 6 feet in diameter. Depth of pits shall accommodate the root system, but should not be deeper than the first main flare root on the plant. A drilled method is not acceptable for the planting of trees. Tree pits should be hand dug or roto-tilled. The sides and bottom of planting pits shall be scarified prior to placing plant materials to remove any glazing affects caused by digging. Top flare root of all trees shall be planted one (1) to two (2) inches higher than finished grade.

970-P14 PLANT INSTALLATION: The Contractor shall set plant material in the planting pit to proper grade and alignment. The plants shall be set upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structures.

970-P15 BACKFILL INSTALLATION: Topsoil shall be used for all tree pits. Contractor shall remove stones larger than one (1) inch diameter and any sticks or extraneous materials. Break up all lumps or clods before backfilling. If topsoil differs from the rootball, provide backfill soil consisting of a mixture of topsoil and the soil type of the rootball to ensure proper water movement and promote root regeneration.

Each plant pit shall be backfilled with the planting soil placed in layers around the roots. Each layer (maximum 6" depth) shall be tamped carefully in a manner to avoid injury to the roots or disturbing the position of the plant. When approximately 2/3 to 3/4 of the tree pit has been backfilled, the hole shall be watered so as to settle the soil in and around all the roots. After the water has been absorbed, the tree pit shall be filled with the planting soil, tampered lightly to grade, and watered thoroughly again to eliminate air pockets. Any further settlement shall be brought to grade with additional planting soil. The Contractor shall ensure proper drainage and prevent any pooling of water around the plant material trunks and stems. The Contractor shall remove any excess excavated materials from the site. All plant materials shall be watered within 2 hours of installation. Any plants found planted too deep shall be raised at the Contractor's expense.

970-P16 PLANT STAKING: Stakes used for securing newly planted trees shall be six feet (6') long standard steel fence posts. Stakes shall be notched or drilled to retain guy wires. The steel posts shall be painted with at least one coat of exterior enamel. The stakes shall be driven so they support the trees and are firm. Guys shall be sufficiently tight and horizontal to transfer support from the stake to the tree. If tree is under 1 1/4" caliper, support with a minimum of one (1) tree stake. If tree is over 1 1/4" caliper, support with two (2) tree stakes.

All deciduous trees shall be staked as shown on planting details. Evergreen trees need not be staked provided they are able to maintain an acceptable and stable upright position as determined by the Project Manager. Align stakes within tree rows for ease of mowing and other maintenance. The Contractor shall be responsible for all adjustments necessary during the warranty and maintenance period.

The Contractor shall be responsible for the removal of the stakes. The stakes, in most situations, should not be left in place for more than one (1) year. Should certain locations require extended staking, as decided by the Project Manager, the staking in those locations shall become the property of the City of Dickinson. The Contractor shall coordinate with the Project Manager to address site specific timelines for the removal of the tree staking. All removed stakes and associated hardware will become the property of the Contractor. All costs associated with the plant

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	4

staking and staking removals shall be included in the bid price for the plant materials.

970-P17 RODENT PROTECTION: Four inch (4") minimum diameter perforated drain tile cylinders shall be installed up to lowest branches for deciduous trees. Rodent Protection shall remain installed through the maintenance period and become the property of the Owner upon final acceptance of the plant material. All costs associated with the perforated drain tile cylinders shall be included in the bid price of the plant materials.

970-P18 MULCH: Mulch materials shall be free of all foreign debris. Mulch shall be kept six inches away from plant trunks and stems. The Contractor shall obtain approval of mulch material from the Project Manager prior to installation. Any mulch material installed without prior approval shall be deemed unacceptable by the Project Manager and shall be removed from the project within 24 hours. Contractor to provide mulch samples to Project Manager for approval.

All planting areas shall be completely weed-free at the time of mulch installations. Mulch areas immediately after plant installation to avoid open soil weed growth problems. The minimum four (4) inch mulch depth will be strictly enforced. Maintain mulch depth unless excess soil moisture or poor drainage at site limits potential survivability. If conditions are such that an adjustment to the mulch depth is necessary to maintain healthy plant materials, the Contractor shall notify the Project Manager in writing to obtain written approval for any changes to the plans and/or specifications.

Wood Mulch: Wood mulch shall be long, fibrous in nature, two (2) to four (4) inches in length. Trees shall have a minimum six (6) foot diameter (or three foot radius) mulched ring if not planted in a mass tree/shrub bed. Thoroughly water mulched areas to a soil depth of at least six (6) inches. The Contractor shall repair all mulch loss and erosion from water damage immediately. All costs associated with furnishing, installing and maintenance of the tree ring mulch shall be included in the cost of the plantings.

970-P19 INITIAL ACCEPTANCE: Upon completion of installation of **ALL** plant materials, the Project Manager will make an inspection of all plant materials and planting areas for acceptability. Any establishment procedures that have not been performed will be brought to the Contractor's attention for immediate correction. Upon the completion of any corrections, a letter of initial acceptance will be provided by the Project Manager.

970-P20 PLANTING / MAINTENANCE SCHEDULE: Initial planting of all trees shall be completed on or before **June 16, 2014**. The Contractor will be responsible for maintenance on all plantings **for one full year** from the date of initial acceptance at which time the City will be responsible for maintenance.

970-P21 RETAINAGE: A landscape retainage amount shall be based on the project bid costs. A **15%** retainage shall be in place after the initial acceptance. (i.e. if a project total bid is \$100,000, landscape retainage would therefore be \$15,000) This retainage includes the standard NDDOT retainage held on a project.

The landscape retainage shall be released on a bi-annual basis. Up to one-half of the landscape retainage may be released at the discretion of the Project Manager on October 31, 2014. Landscape retainage release shall be based on the Contractor's performance of the plant establishment procedures. Upon final inspection and acceptance of the plant materials, the remaining landscape retainage shall be released prior to closeout of the project.

970-P22 PLANT ESTABLISHMENT PROCEDURES: The establishment procedures through the extent of the contract shall include additional pruning, protective measures against pests and diseases (including rabbit and/or rodent protection), replacing mulch, keeping the stakes firm and guys adjusted, weeding with a pre-emergent weed control or other pre-approved means, the removal of any dead plant material from the project, and other establishment procedures as deemed necessary by the Project Manager. Tree rings shall be cleared of weeds a minimum of once per month. This includes the area immediately adjacent and within one foot of the mulch edge.

The Contractor is responsible for notifying the Project Manager five (5) days prior to all scheduled maintenance. The Project Manager shall notify the Contractor should any additional site visits be necessary to maintain proper planting conditions.

A detailed inspection form shall be submitted to the Project Manager with the corresponding project payrolls. The following minimum information is required on the forms: Project name, Project number, Name of Contractor, Corresponding Payroll Reference, Date of Work, Type of Work, and Comments Section.

970-P23 PLANT MATERIALS REPLACEMENT: Any plant material that is 25% or more dead, as determined by the Project Manager, shall be considered dead and must be replaced by the Contractor. Trees shall be considered dead when the main leader has died back, or 25% of the crown is dead. Shrubs shall be considered dead when 25% of the branching is dead. Removal of designated plant material shall occur immediately; replacement shall occur immediately or as soon as possible in accordance with acceptable planting dates and weather conditions.

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	5

970-P24 PLANTING/REPLANTING DATES: Allowable planting dates for initial installation and for replacement plant materials shall be as listed below. Weather conditions may allow for the planting of the plant materials to occur outside of these dates. Written approval from the Project Manager shall be required in all such instances.

Spring: April 15 – June 16
Fall: September 15 – October 15

970-P25 PROJECT INSPECTIONS: Project inspections shall occur every month of the warranty/maintenance period (during a typical growing season). The Contractor shall be notified of any unacceptable plant materials or site conditions which need to be corrected.

970-P26 PLANT MAINTENANCE RECOMMENDATIONS: The Contractor shall provide written recommendations for care of the project site. Listed procedures for maintenance shall include, but not be limited to, all pruning, watering, fertilizing, potential changes at different stages of the plant materials growth, etc. It will also indicate any specific site needs based on any site micro-climate situations.

970-P27 FINAL ACCEPTANCE: Upon completion of the warranty/maintenance period, the Project Manager will make an inspection of the plant materials for acceptability. Typically the inspection will be made during the week that the warranty/maintenance period terminates. All items of maintenance shall have been performed prior to inspection. Any items of maintenance that have not been performed may make a plant unacceptable. Any establishment procedures that have not been performed shall be brought to the Contractor's attention for immediate correction. Upon the completion of any corrections, a letter of final acceptance shall be provided by the Project Manager notifying the Contractor of completion of the project.

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation

ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	6	6

ENVIRONMENTAL COMMITMENTS: The North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

COMMITMENT NO. 1: Based on the NEPA documentation, no additional permits or environmental commitments have been identified beyond what is covered by the NDDOT's Standard Specification of Road and Bridge Construction.

Wetland Number	Cowardin Classification	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands	Impacts to Wetlands	
						Temp.	Perm.
There are a number of adjacent wetlands; however, no impacts are anticipated within the limits of construction.							
TOTALS:				0.00		0.00	0.00

*A wetland Jurisdictional Determination was issued by the USACE on 02/10/2011; NWO-2011-00086-BIS.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TEU-5-022(115)072	8	1

SPEC	CODE	DESCRIPTION	UNIT	QUANTITY
103	0100	CONTRACT BOND	LSUM	1
702	0100	MOBILIZATION	LSUM	1
708	1410	FIBER ROLLS 6IN	LF	675
970	1000	TREES	EA	18
970	1001	TREES GROUP A	EA	41
970	1002	TREES GROUP B	EA	18
970	1003	TREES GROUP C	EA	11
970	2011	AMUR MAPLE	EA	16
970	2028	TATARIAN MAPLE	EA	14
970	2029	OHIO BUCKEYE	EA	3
970	2050	COMMON HACKBERRY	EA	24
970	2140	KENTUCKY COFFEETREE	EA	4
970	2150	NORTHERN ACCLAIM HONEYLOCUST	EA	36
970	2191	PINK SPIRES CRABAPPLE	EA	10
970	2194	RED SPLENDOR CRABAPPLE	EA	14
970	2200	SNOW DRIFT CRABAPPLE	EA	30
970	2210	DOUBLE FLOWERING PLUM TREE FORM	EA	13
970	2405	JAPANESE TREE LILAC	EA	18
970	2529	TOBA HAWTHORNE	EA	24
970	3560	MEDORA JUNIPER	EA	10
970	3563	WICHITA BLUE JUNIPER	EA	24
970	3600	BLACK HILLS SPRUCE	EA	8
970	3604	COLORADO SPRUCE	EA	12
970	3625	PONDEROSA PINE	EA	12

Dickinson Highway 22
Landscape Enhancement Project
Quantities

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	10	1

Plant Schedule

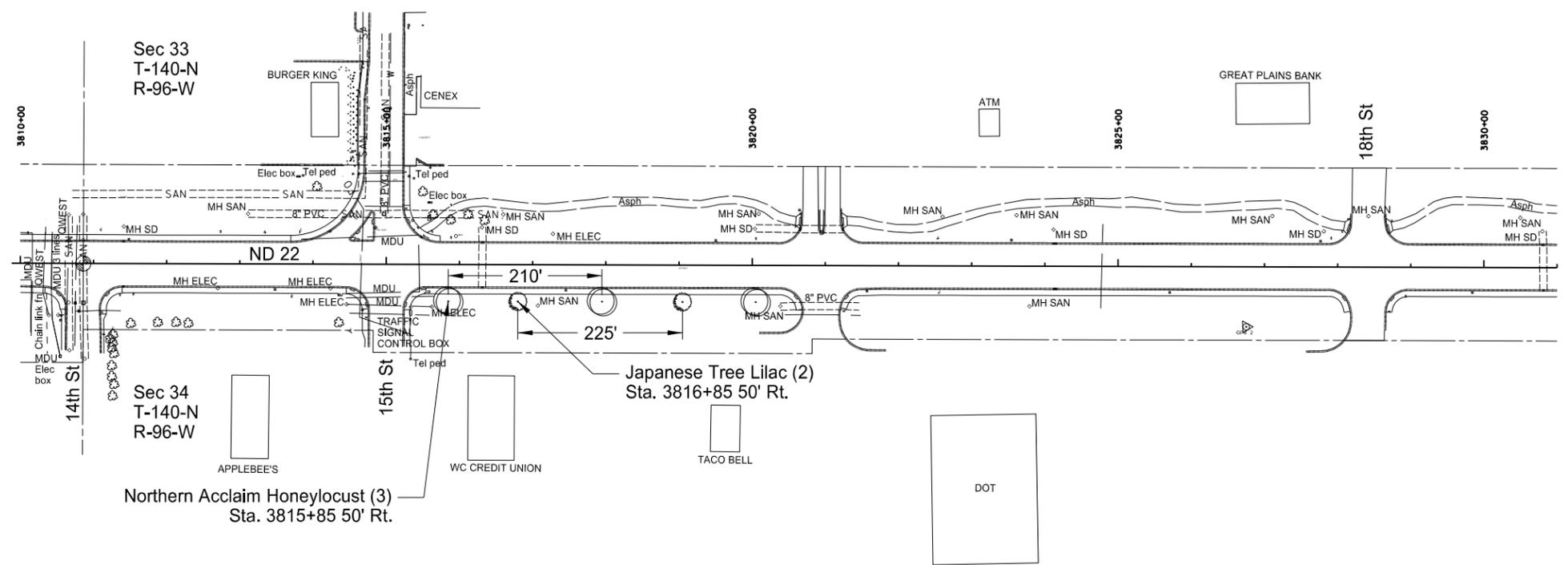
SPEC	CODE	GROUP/ DISCRIPTION	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANTITY
970	1000	TREES	OAK LEAF MOUNTAIN ASH	<i>Sorbus hybrida</i>	1.5" Cal	18 EA
970	1001	TREES GROUP A	CORALBURST CRABAPPLE	<i>Malus 'Coralcole'</i>	1.5" Cal	13 EA
			KELSEY CRABAPPLE	<i>Malus 'Kelsey'</i>	1.5" Cal	18 EA
			RADIANT CRABAPPLE	<i>Malus 'Radiant'</i>	1.5" Cal	10 EA
970	1002	TREES GROUP B	FIRST ADDITIONS SKY HIGH JUNIPER	<i>Juniperus scopulorum 'Bailigh'</i>	3.5' Height	8 EA
			WELCH JUNIPER	<i>Juniperus scopulorum 'Welchi'</i>	3.5' Height	10 EA
970	1003	TREES GROUP C	IRONWOOD	<i>Ostrya virginiana</i>	2" Cal	3 EA
			SIENNA GLEN MAPLE	<i>Acer x freemanii 'Sienna'</i>	2" Cal	8 EA
970	2011		AMUR MAPLE	<i>Acer ginnala</i>	1.5" Cal	16 EA
970	2028		TATARIAN MAPLE	<i>Acer tataricum</i>	1.5" Cal	14 EA
970	2029		OHIO BUCKEYE	<i>Aesculus glabra</i>	2" Cal	3 EA
970	2050		COMMON HACKBERRY	<i>Celtis occidentalis</i>	2" Cal	24 EA
970	2140		KENTUCKY COFFEETREE	<i>Gymnocladus dioica</i>	1.5" Cal	4 EA
970	2150		NORTHERN ACCLAIM HONEYLOCUST	<i>Gleditsia triacanthus var. inermis 'Harve'</i>	1.5" Cal	36 EA
970	2191		PINK SPIRES CRABAPPLE	<i>Malus 'Pink Spires'</i>	1.5" Cal	10 EA
970	2194		RED SPLENDOR CRABAPPLE	<i>Malus 'Red Splendor'</i>	1.75" Cal	14 EA
970	2200		SNOW DRIFT CRABAPPLE	<i>Malus 'Snowdrift'</i>	1.75" Cal	30 EA
970	2210		DOUBLE FLOWERING PLUM TREE FORM	<i>Prunus triloba</i>	1.5" Cal	13 EA
970	2405		JAPANESE TREE LILAC	<i>Syringa reticulata</i>	1.5" Cal	18 EA
970	2529		TOBA HAWTHORNE	<i>Crataegus x mordenensis 'Toba'</i>	1.5" Cal	24 EA
970	3560		MEDORA JUNIPER	<i>Juniperus scopulorum 'Medora'</i>	3.5' Height	10 EA
970	3563		WICHITA BLUE JUNIPER	<i>Juniperus scopulorum 'Wichita Blue'</i>	3.5' Height	24 EA
970	3600		BLACK HILLS SPRUCE	<i>Picea glauca var. densata</i>	4' Height	8 EA
970	3604		COLORADO SPRUCE	<i>Picea pungens</i>	4' Height	12 EA
970	3625		PONDEROSA PINE	<i>Pinus ponderosa</i>	4' Height	12 EA

This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA-3, on 08/23/13 and the original document is stored at the North Dakota Department of Transportation



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	1

- Northern Acclaim Honeylocust
Sta. 3815+85 50' Rt. 3 EA
- Japanese Tree Lilac
Sta. 3816+85 50' Rt. 2 EA

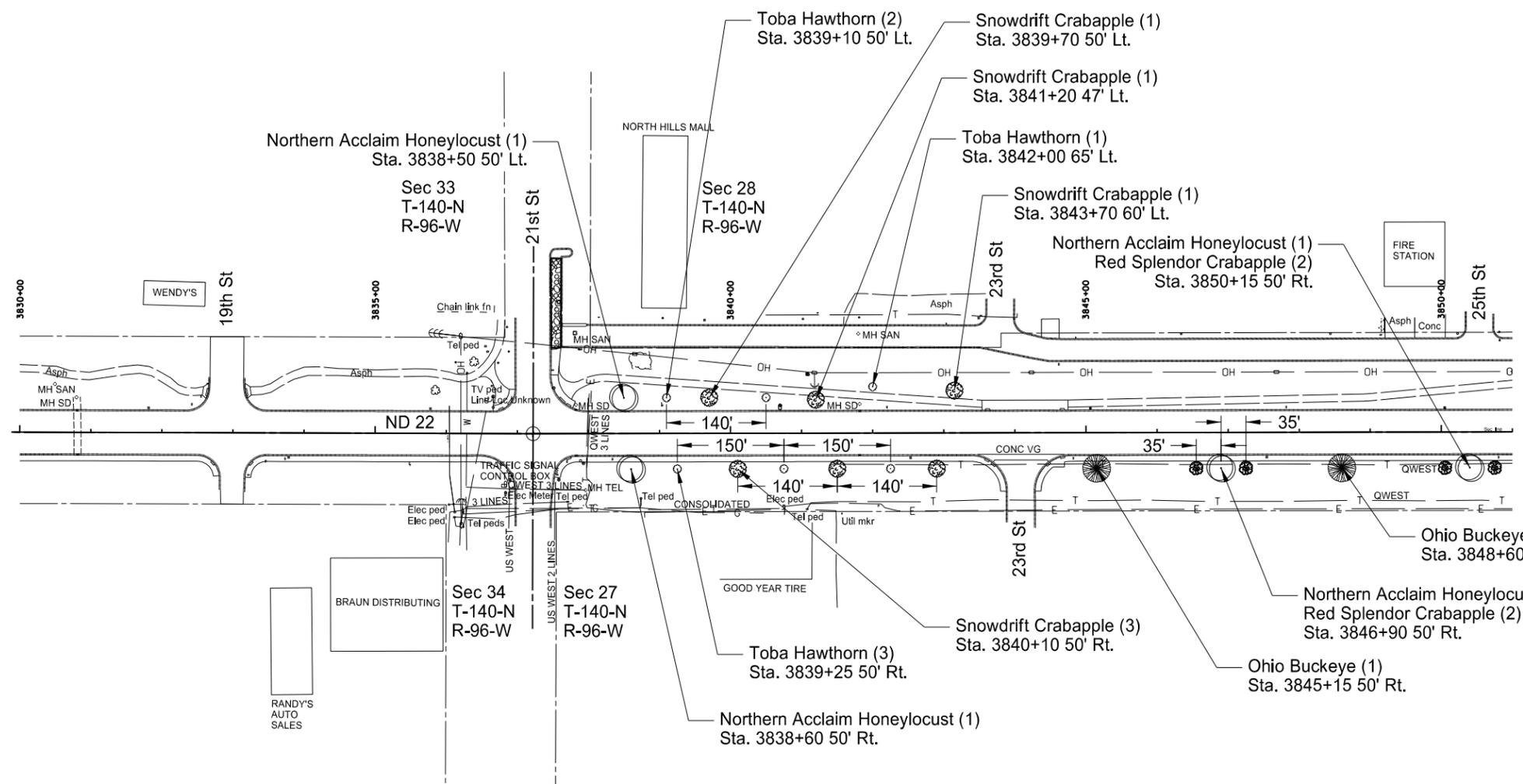


This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3810+00 - Sta.3830+00



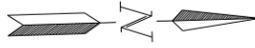
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	2



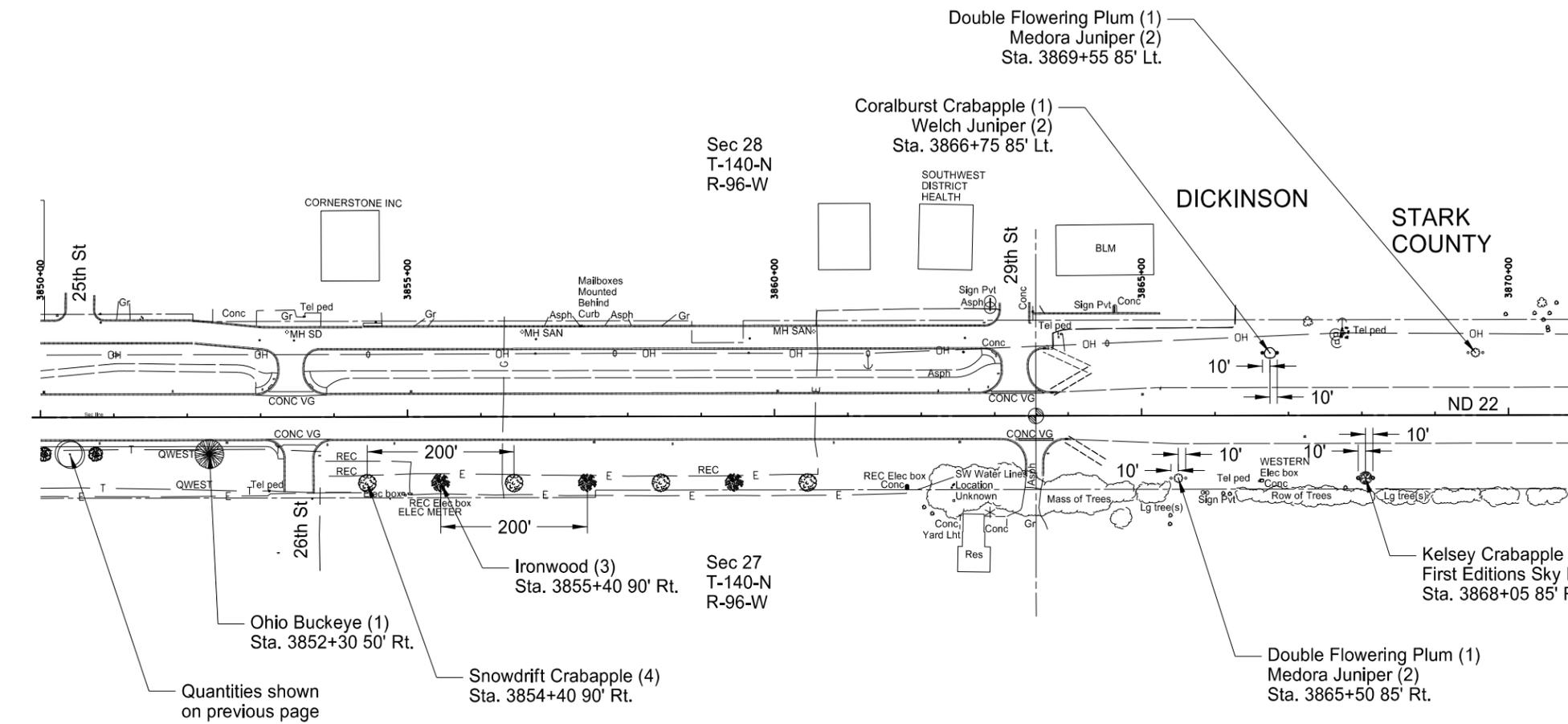
-  Ohio Buckeye
 Sta. 3845+15 50' Rt. 1 EA
 Sta. 3848+60 50' Rt. 1 EA
-  Northern Acclaim Honeylocust
 Sta. 3838+50 50' Lt. 1 EA
 Sta. 3838+60 50' Rt. 1 EA
 Sta. 3846+90 50' Rt. 1 EA
 Sta. 3850+15 50' Rt. 1 EA
-  Red Splendor Crabapple
 Sta. 3846+90 50' Rt. 2 EA
 Sta. 3850+15 50' Rt. 2 EA
-  Snowdrift Crabapple
 Sta. 3839+70 50' Lt. 2 EA
 Sta. 3840+10 50' Rt. 3 EA
 Sta. 3841+20 47' Lt. 1 EA
 Sta. 3843+70 60' Lt. 1 EA
-  Toba Hawthorn
 Sta. 3839+10 50' Lt. 1 EA
 Sta. 3839+25 50' Rt. 3 EA
 Sta. 3842+00 65' Lt. 1 EA

This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3830+00 - Sta.3850+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	3



⊙	Trees Group A	
	Sta. 3866+75 85' Lt.	1 EA
	Sta. 3868+05 85' Rt.	1 EA
⋮	Trees Group B	
	Sta. 3866+75 85' Lt.	2 EA
	Sta. 3868+05 85' Rt.	2 EA
⊙	Trees Group C	
	Sta. 3855+40 90' Rt.	3 EA
⊙	Ohio Buckeye	
	Sta. 3852+30 50' Rt.	1 EA
⊙	Snowdrift Crabapple	
	Sta. 3854+40 90' Rt.	4 EA
⊙	Double Flowering Plum	
	Sta. 3865+50 85' Rt.	1 EA
	Sta. 3869+55 85' Lt.	1 EA
⋮	Medora Juniper	
	Sta. 3865+50 85' Rt.	2 EA
	Sta. 3869+55 85' Lt.	2 EA

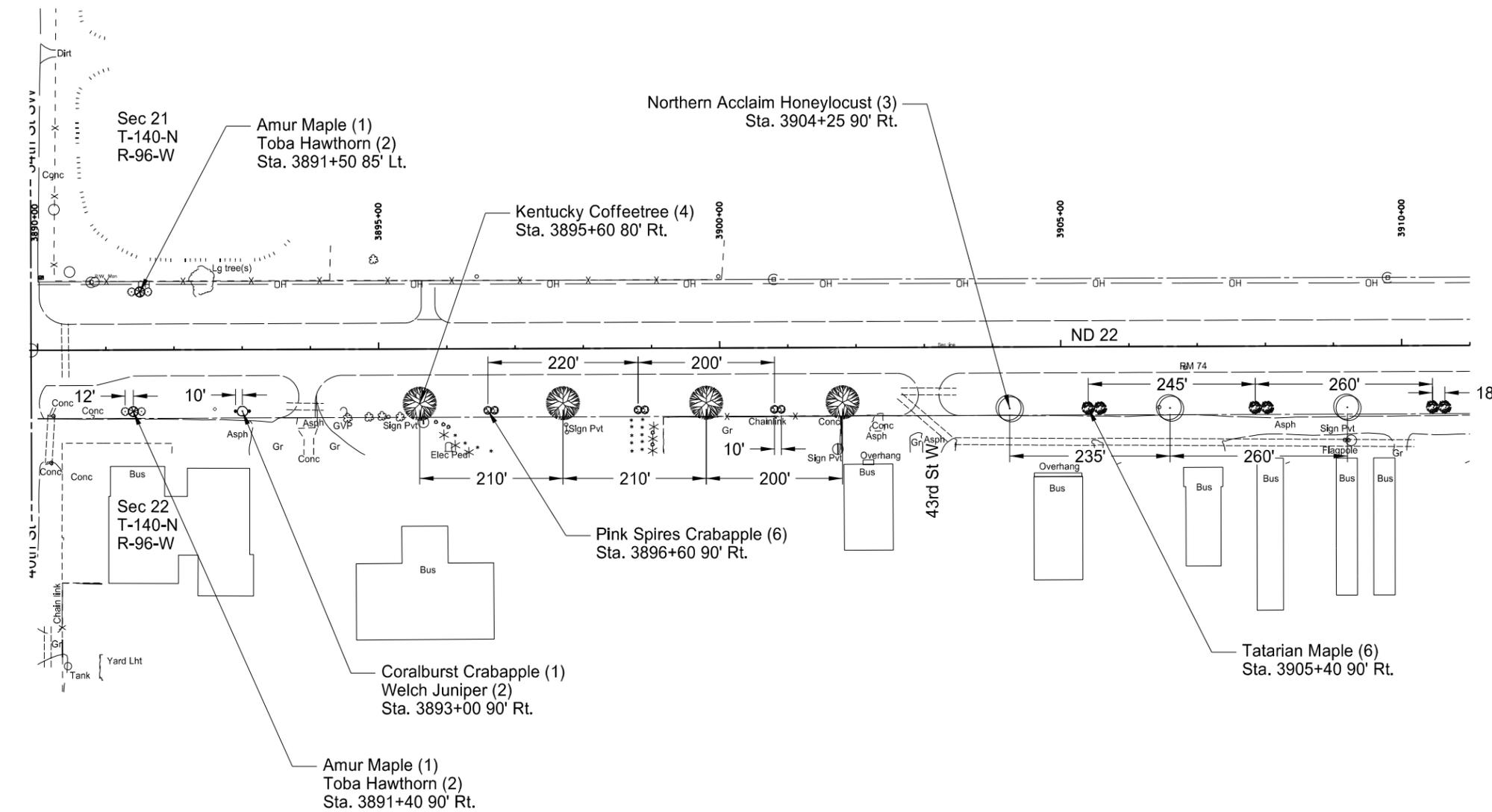
Quantities shown on previous page

This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3850+00 - Sta.3870+00



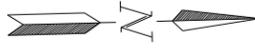
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	5



- Trees Group A
Sta. 3893+00 90' Rt. 1 EA
- Trees Group B
Sta. 3893+00 90' Rt. 2 EA
- ⊗ Amur Maple
Sta. 3891+40 90' Rt. 1 EA
Sta. 3891+50 85' Lt. 1 EA
- ⊗ Tatarian Maple
Sta. 3905+40 90' Rt. 6 EA
- ⊗ Kentucky Coffeetree
Sta. 3895+60 80' Rt. 4 EA
- Northern Acclaim Honeylocust
Sta. 3904+25 90' Rt. 3 EA
- ⊗ Pink Spires Crabapple
Sta. 3896+60 90' Rt. 6 EA
- Toba Hawthorn
Sta. 3891+40 90' Rt. 2 EA
Sta. 3891+50 85' Lt. 2 EA

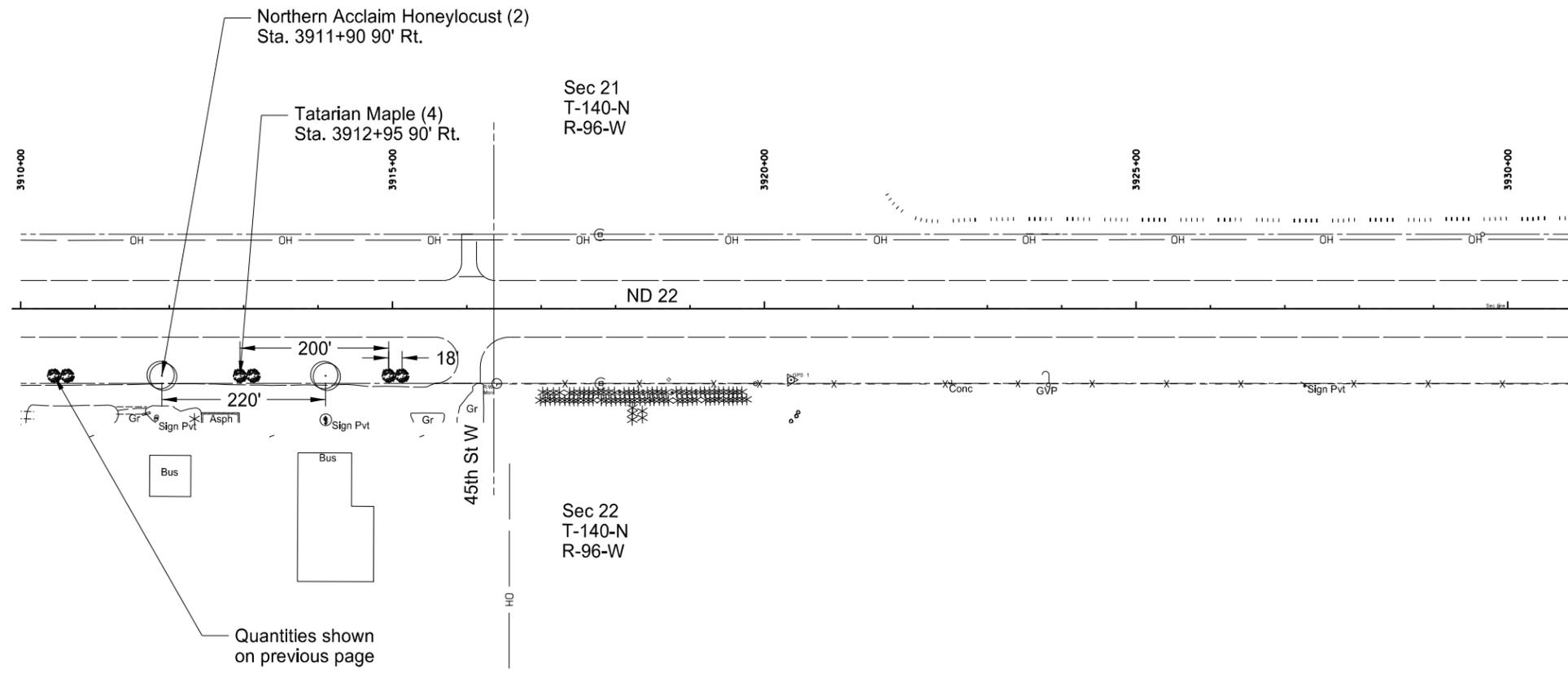
This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3890+00 - Sta.3910+00



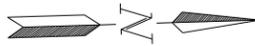
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	6

- Tatarian Maple
Sta. 3912+95 90' Rt. 4 EA
- Northern Acclaim Honeylocust
Sta. 3911+90 90' Rt. 2 EA



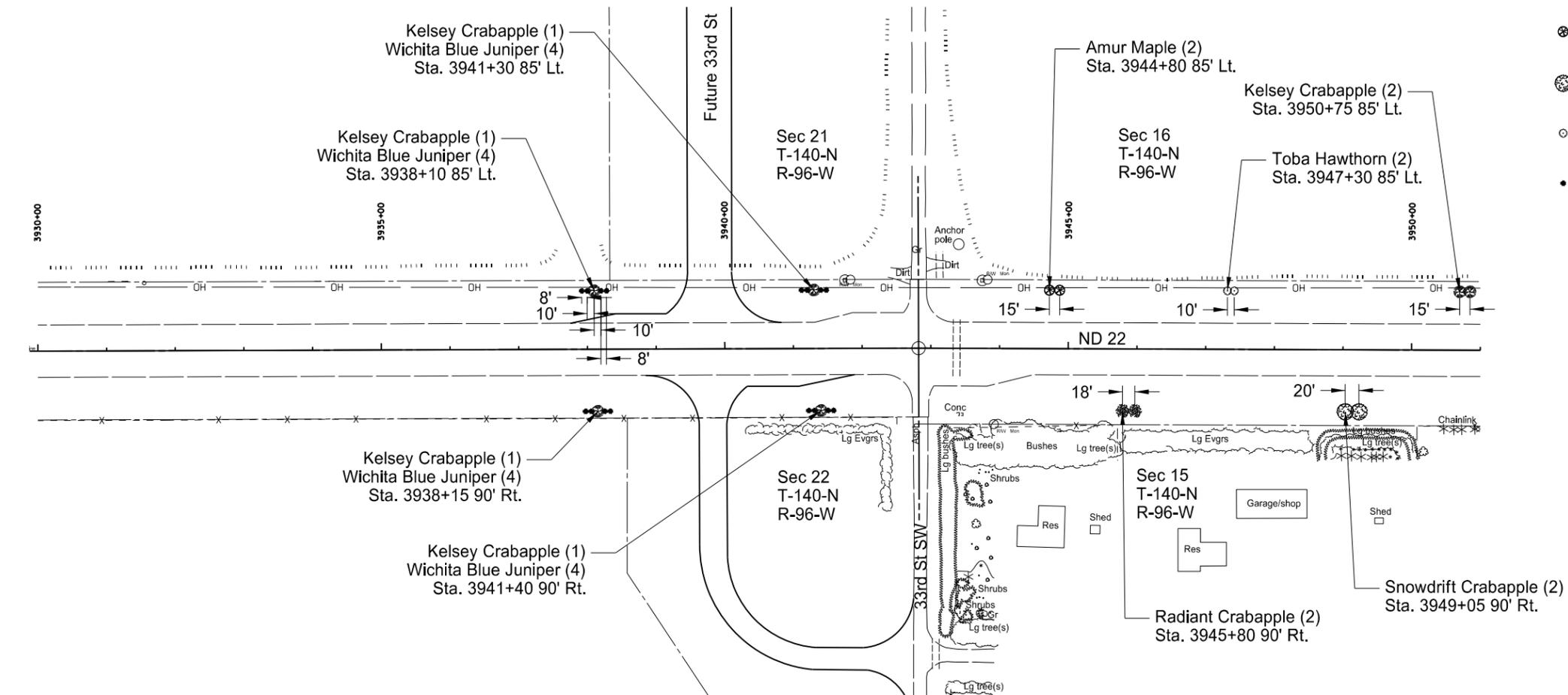
This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3910+00 - Sta.3930+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	7

NOTE: The Kelsey Crabapple and Wichita Blue Juniper, shown on either side of Future 33rd St., may be relocated to another area of the corridor should that project's construction timeline not be practical for the installation of plant materials.



- Trees Group A**
 - Sta. 3938+10 85' Lt. 1 EA
 - Sta. 3938+15 90' Rt. 1 EA
 - Sta. 3941+30 85' Lt. 1 EA
 - Sta. 3941+40 90' Rt. 1 EA
 - Sta. 3945+80 90' Rt. 2 EA
 - Sta. 3950+75 85' Lt. 2 EA
- Amur Maple**
 - Sta. 3944+80 85' Lt. 2 EA
- Snowdrift Crabapple**
 - Sta. 3949+05 90' Rt. 2 EA
- Toba Hawthorn**
 - Sta. 3947+30 85' Lt. 2 EA
- Wichita Blue Juniper**
 - Sta. 3938+10 85' Lt. 4 EA
 - Sta. 3938+15 90' Rt. 4 EA
 - Sta. 3941+30 85' Lt. 4 EA
 - Sta. 3941+40 90' Rt. 4 EA

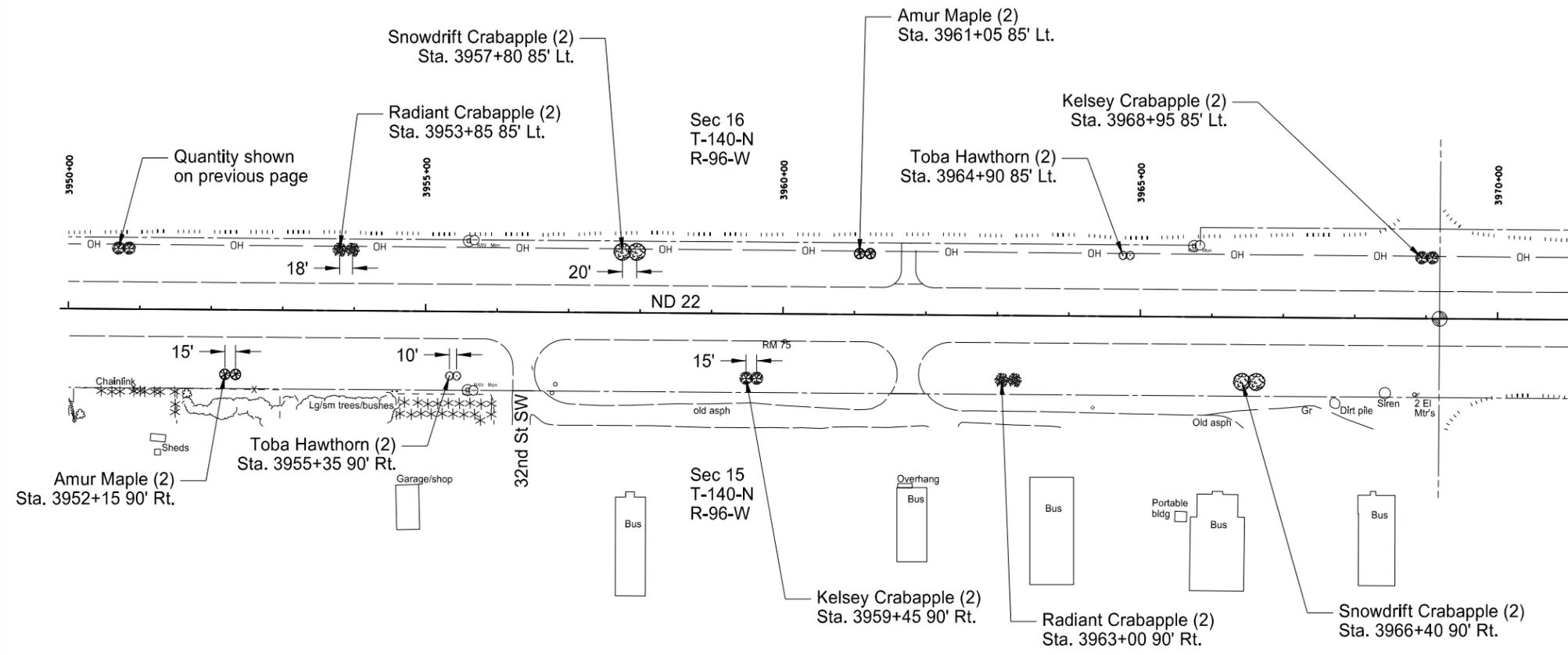
This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3930+00 - Sta.3950+00



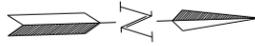
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	8

-  **Trees Group A**
 Sta. 3953+85 85' Lt. 2 EA
 Sta. 3959+45 90' Rt. 2 EA
 Sta. 3963+00 90' Rt. 2 EA
 Sta. 3968+95 85' Lt. 2 EA
-  **Amur Maple**
 Sta. 3952+15 90' Rt. 2 EA
 Sta. 3961+05 85' Lt. 2 EA
-  **Snowdrift Crabapple**
 Sta. 3957+80 85' Lt. 2 EA
 Sta. 3966+40 90' Rt. 2 EA
-  **Toba Hawthorn**
 Sta. 3955+35 90' Rt. 2 EA
 Sta. 3964+90 85' Lt. 2 EA

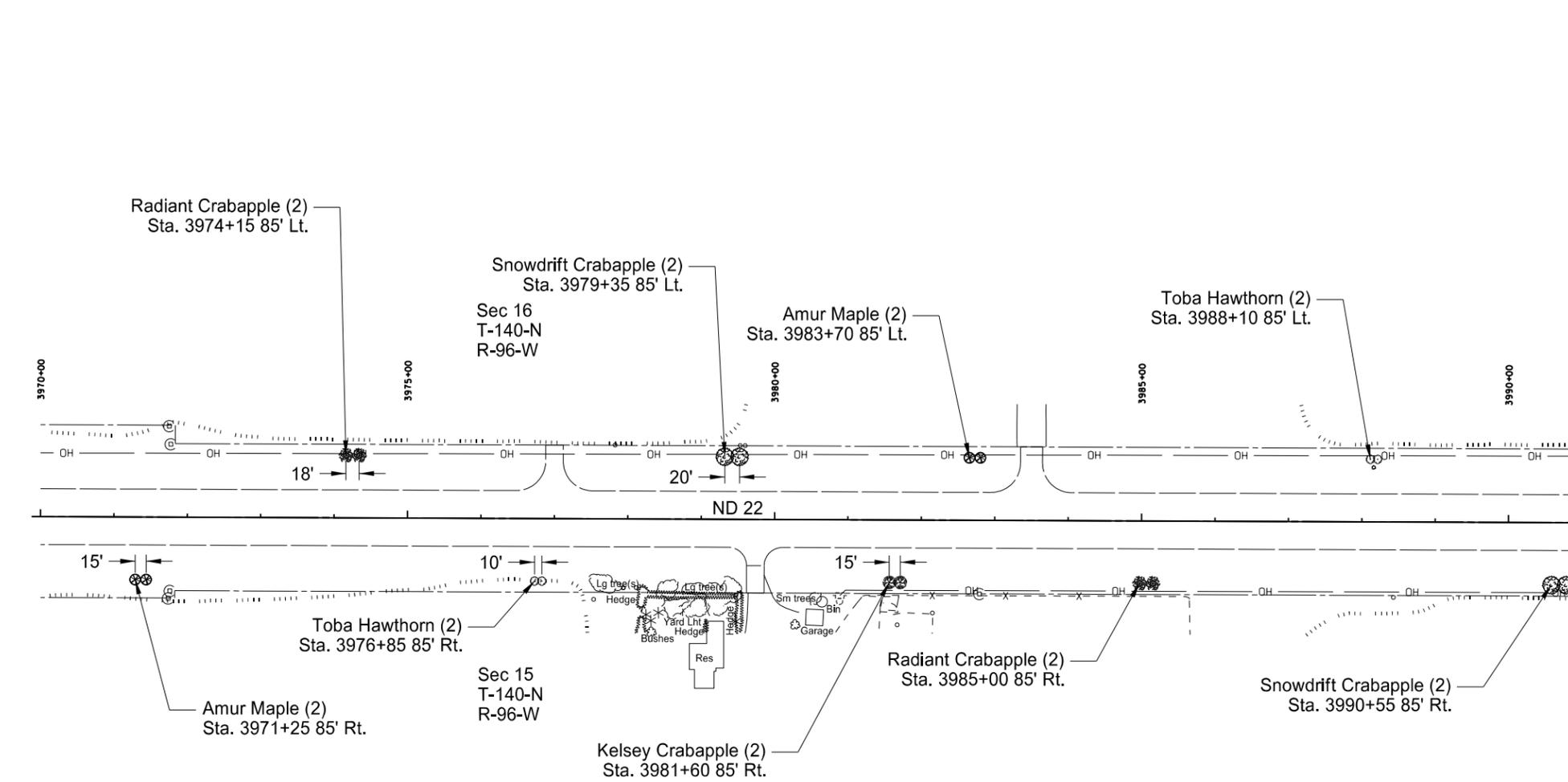


This document was originally issued and sealed by Alexis J. Wallevand, Registration Number LA- 3, on 8/23/13 and the original document is stored at the North Dakota Department of Transportation.

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3950+00 - Sta.3970+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	9



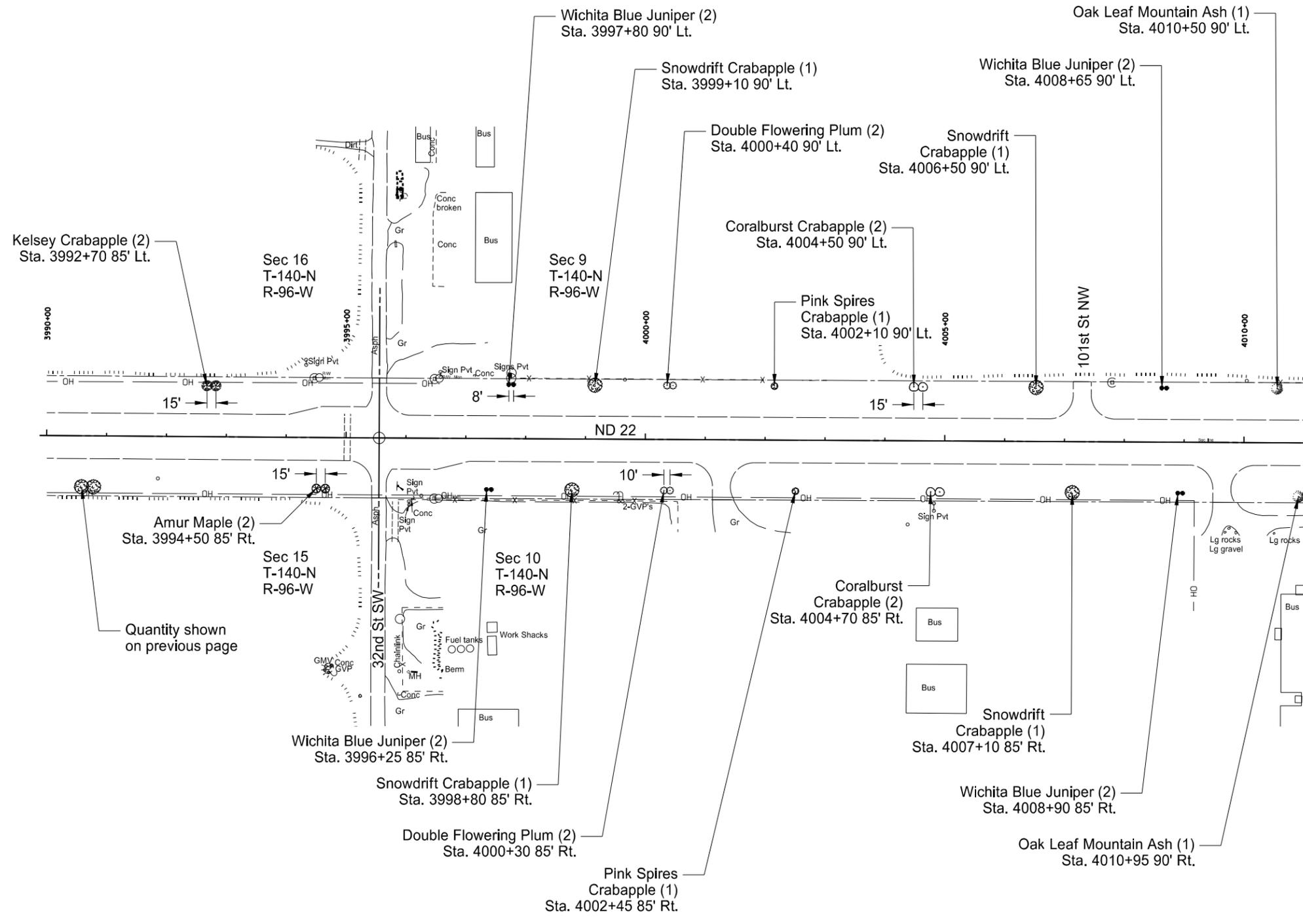
- Trees Group A**
 Sta. 3974+15 85' Lt. 2 EA
 Sta. 3981+60 85' Rt. 2 EA
 Sta. 3985+00 85' Rt. 2 EA
- Amur Maple**
 Sta. 3971+25 85' Rt. 2 EA
 Sta. 3983+70 85' Lt. 2 EA
- Snowdrift Crabapple**
 Sta. 3979+35 85' Lt. 2 EA
 Sta. 3990+55 85' Rt. 2 EA
- Toba Hawthorn**
 Sta. 3976+85 85' Rt. 2 EA
 Sta. 3988+10 85' Lt. 2 EA

This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 3970+00 - Sta.3990+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	10



● Trees		
Sta. 4010+50 90' Lt.		1 EA
Sta. 4010+95 90' Rt.		1 EA
● Trees Group A		
Sta. 3992+70 85' Lt.		2 EA
Sta. 4004+50 90' Lt.		2 EA
Sta. 4004+70 85' Rt.		2 EA
● Amur Maple		
Sta. 3994+50 85' Rt.		2 EA
● Pink Spires Crabapple		
Sta. 4002+10 90' Lt.		1 EA
Sta. 4002+45 85' Rt.		1 EA
● Snowdrift Crabapple		
Sta. 3998+80 85' Rt.		1 EA
Sta. 3999+10 90' Lt.		1 EA
Sta. 4006+50 90' Lt.		1 EA
Sta. 4007+10 85' Rt.		1 EA
● Double Flowering Plum		
Sta. 4000+30 85' Rt.		2 EA
Sta. 4000+40 90' Lt.		2 EA
● Wichita Blue Juniper		
Sta. 3996+25 85' Rt.		2 EA
Sta. 3997+80 90' Lt.		2 EA
Sta. 4008+65 90' Lt.		2 EA
Sta. 4008+90 85' Rt.		2 EA

Quantity shown on previous page

This document was originally issued and sealed by Alexis J. Wallevand Registration Number LA- 3, on 8/23/13 and the original document is stored at the North Dakota Department of Transportation

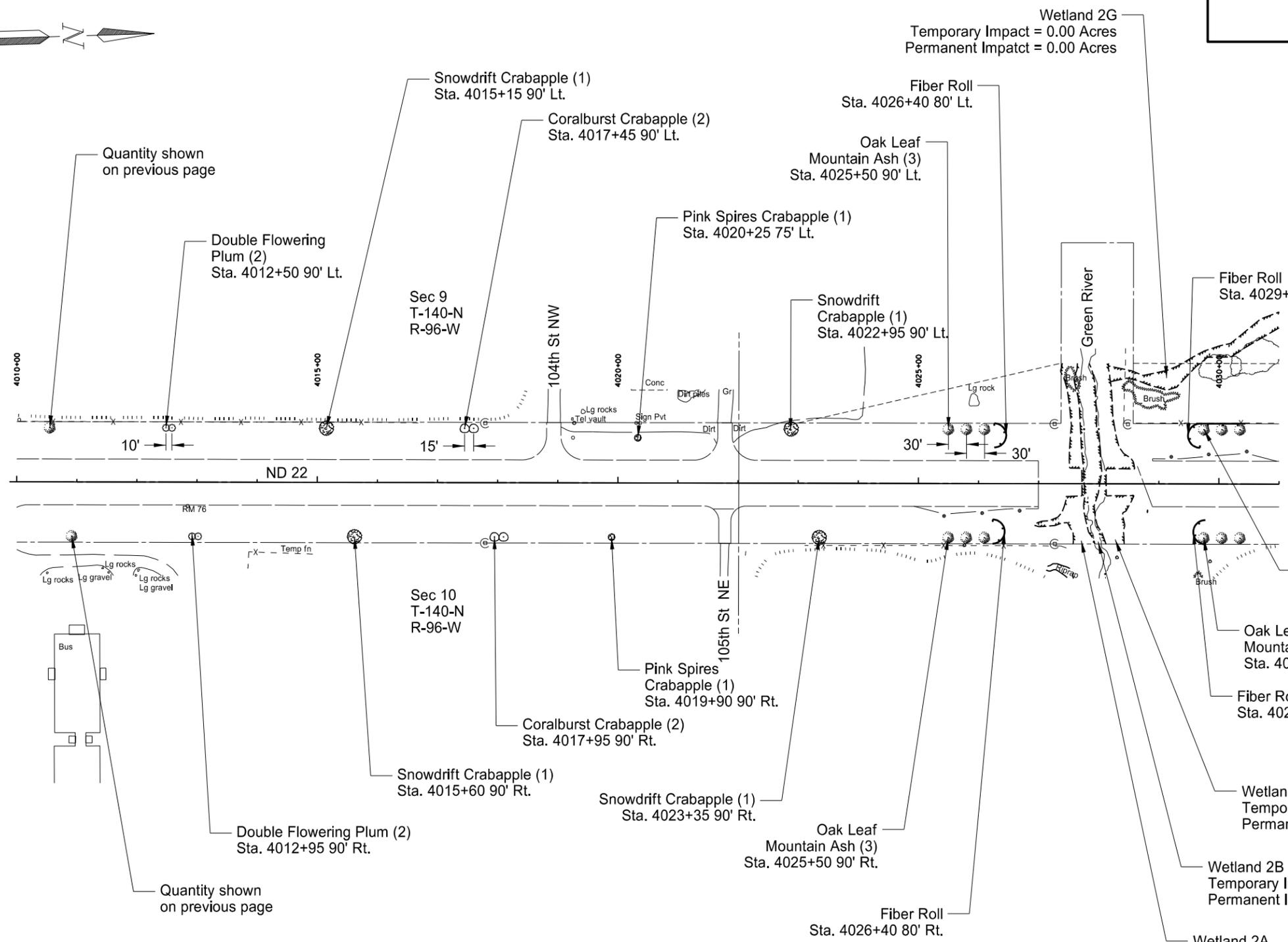
Dickinson Highway 22
Landscape Enhancement Project

Landscape Layout

Sta. 3990+00 - Sta.4010+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	11



Fiber Roll 6IN Sta. 4026+40 80' Lt. Sta. 4026+40 80' Rt. Sta. 4029+50 80' Lt. Sta. 4029+50 80' Rt.	60 LF 60 LF 135 LF 60 LF
● Trees Sta. 4025+50 90' Rt. Sta. 4025+50 90' Lt. Sta. 4029+75 90' Rt. Sta. 4029+75 90' Lt.	3 EA 3 EA 3 EA 3 EA
○ Trees Group A Sta. 4017+45 90' Lt. Sta. 4017+95 90' Rt.	2 EA 2 EA
● Pink Spires Crabapple Sta. 4019+90 90' Rt. Sta. 4020+25 90' Lt.	1 EA 1 EA
● Snowdrift Crabapple Sta. 4015+15 90' Lt. Sta. 4015+60 90' Rt. Sta. 4022+95 90' Lt. Sta. 4023+35 90' Rt.	1 EA 1 EA 1 EA 1 EA
○ Double Flowering Plum Sta. 4012+50 90' Lt. Sta. 4012+95 90' Rt.	2 EA 2 EA

Oak Leaf Mountain Ash (3)
Sta. 4029+75 90' Lt.

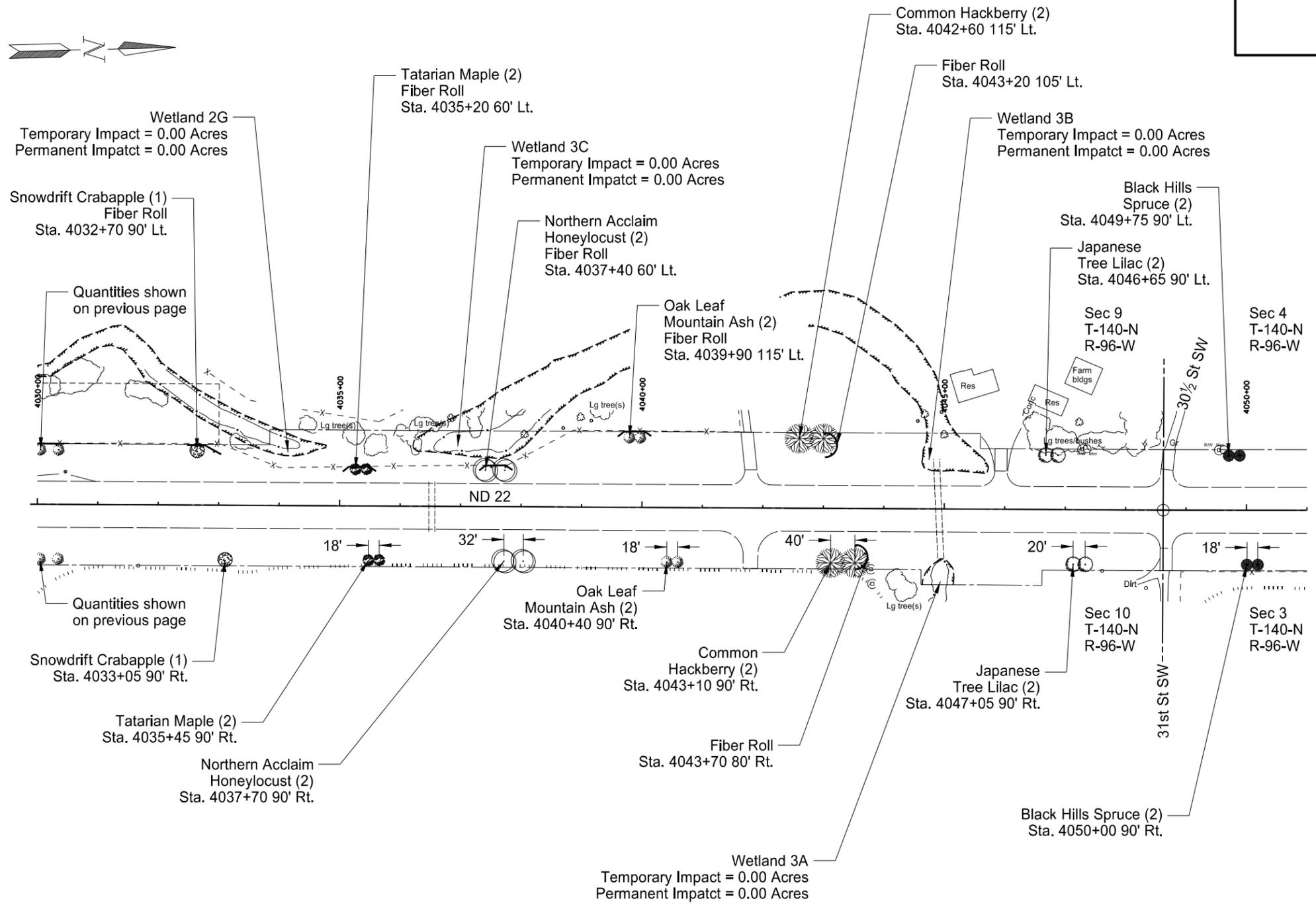
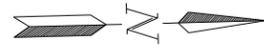
Oak Leaf Mountain Ash (3)
Sta. 4029+75 90' Rt.

Fiber Roll
Sta. 4029+50 80' Rt.

This document was originally issued and sealed by Alexis J. Wallevand Registration Number LA- 3, on 8/23/13 and the original document is stored at the North Dakota Department of Transportation

Dickinson Highway 22
Landscape Enhancement Project
Landscape Layout
Sta. 4010+00 - Sta.4030+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	12



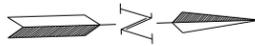
Fiber Roll 6IN	
Sta. 4032+70 90' Lt.	60 LF
Sta. 4035+20 60' Lt.	60 LF
Sta. 4037+40 60' Lt.	60 LF
Sta. 4039+90 115' Lt.	60 LF
Sta. 4043+20 105' Lt.	60 LF
Sta. 4043+70 80' Rt.	60 LF
Trees	
Sta. 4039+90 115' Lt.	2 EA
Sta. 4040+40 90' Rt.	2 EA
Tatarian Maple	
Sta. 4035+20 60' Lt.	2 EA
Sta. 4035+45 90' Rt.	2 EA
Common Hackberry	
Sta. 4042+60 115' Lt.	2 EA
Sta. 4043+10 90' Rt.	2 EA
Northern Acclaim Honeylocust	
Sta. 4037+40 60' Lt.	2 EA
Sta. 4037+70 90' Rt.	2 EA
Snowdrift Crabapple	
Sta. 4032+70 90' Lt.	1 EA
Sta. 4033+05 90' Rt.	1 EA
Japanese Tree Lilac	
Sta. 4046+65 90' Lt.	2 EA
Sta. 4047+05 90' Rt.	2 EA
Black Hills Spruce	
Sta. 4049+75 90' Lt.	2 EA
Sta. 4050+00 90' Rt.	2 EA

This document was originally issued and sealed by Alexis J. Wallevand Registration Number LA- 3, on 8/23/13 and the original document is stored at the North Dakota Department of Transportation

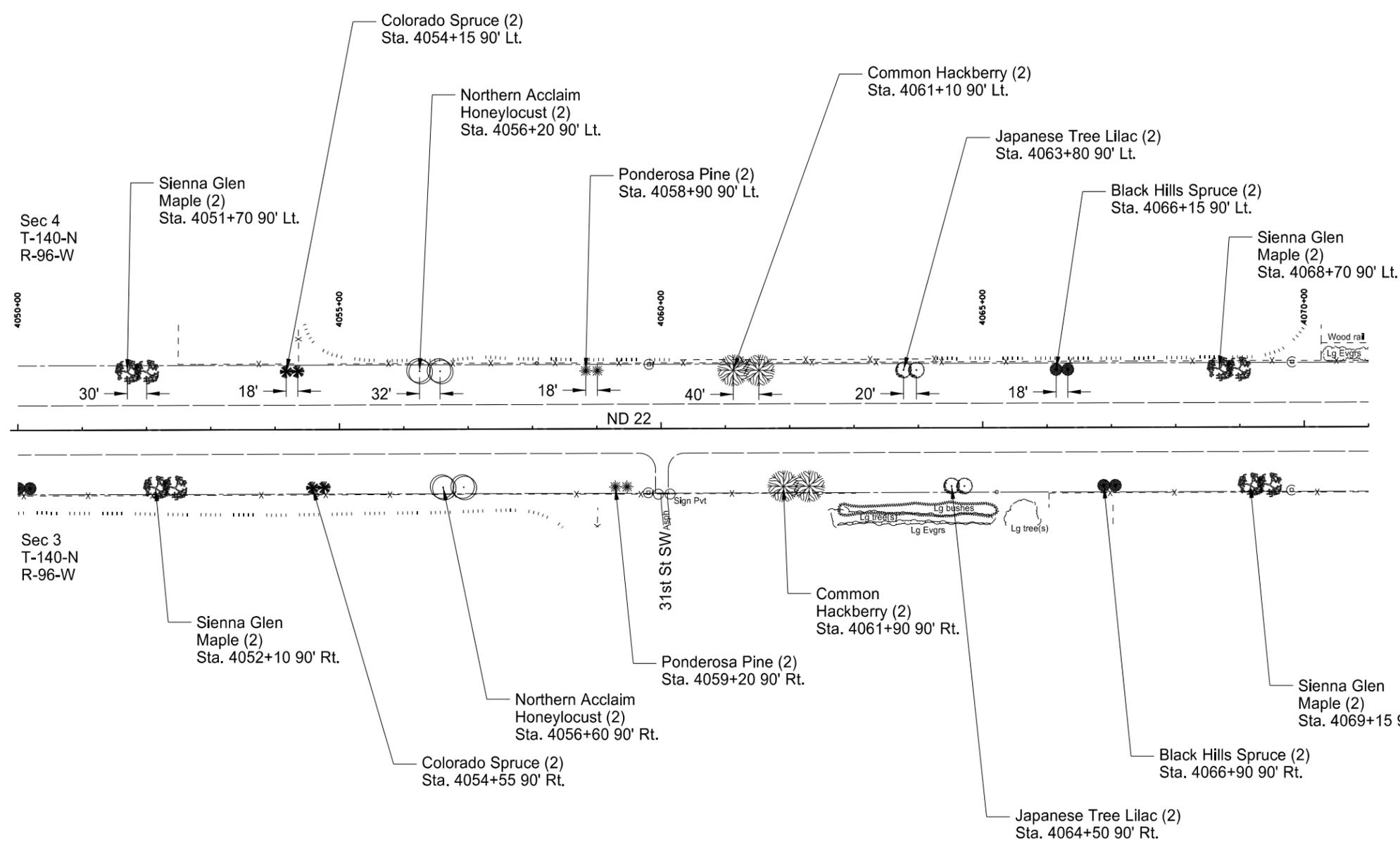
Dickinson Highway 22
Landscape Enhancement Project

Landscape Layout

Sta. 4030+00 - Sta.4050+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	13



	Trees Group C	
	Sta. 4051+70 90' Lt.	2 EA
	Sta. 4052+10 90' Rt.	2 EA
	Sta. 4068+70 90' Lt.	2 EA
	Sta. 4069+15 90' Rt.	2 EA
	Common Hackberry	
	Sta. 4061+10 90' Lt.	2 EA
	Sta. 4061+90 90' Rt.	2 EA
	Northern Acclaim Honeylocust	
	Sta. 4056+20 90' Lt.	2 EA
	Sta. 4056+60 90' Rt.	2 EA
	Japanese Tree Lilac	
	Sta. 4063+80 90' Lt.	2 EA
	Sta. 4064+50 90' Rt.	2 EA
	Black Hills Spruce	
	Sta. 4066+15 90' Lt.	2 EA
	Sta. 4066+90 90' Rt.	2 EA
	Colorado Spruce	
	Sta. 4054+15 90' Lt.	2 EA
	Sta. 4054+55 90' Rt.	2 EA
	Ponderosa Pine	
	Sta. 4058+90 90' Lt.	2 EA
	Sta. 4059+20 90' Rt.	2 EA

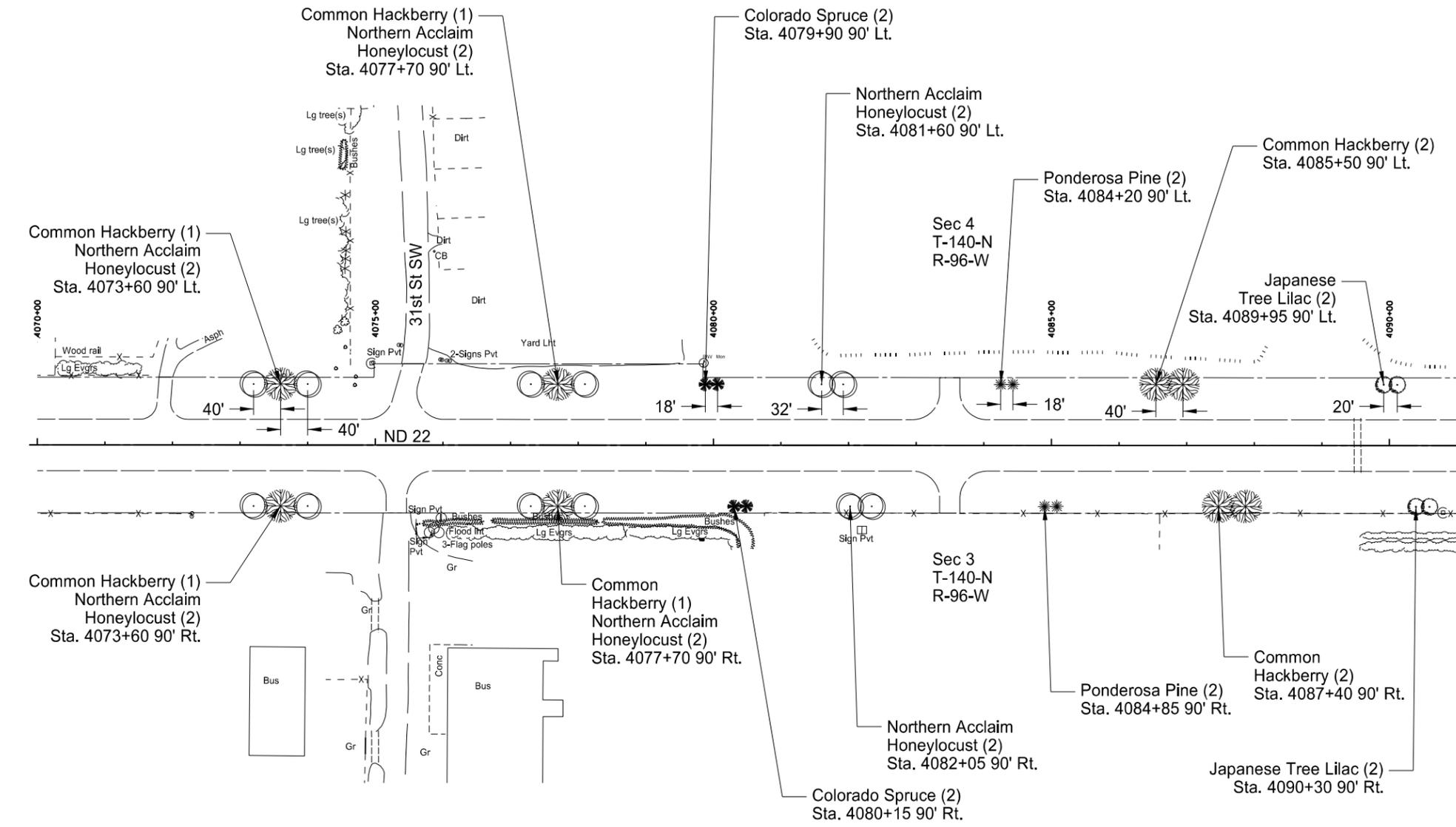
This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 4050+00 - Sta.4070+00



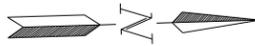
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	14

	Common Hackberry Sta. 4073+60 90' Lt. Sta. 4073+60 90' Rt. Sta. 4077+70 90' Lt. Sta. 4077+70 90' Rt. Sta. 4085+50 90' Lt. Sta. 4087+40 90' Rt.	1 EA 1 EA 1 EA 1 EA 2 EA 2 EA
	Northern Acclaim Honeylocust Sta. 4073+60 90' Lt. Sta. 4073+60 90' Rt. Sta. 4077+70 90' Lt. Sta. 4077+70 90' Rt. Sta. 4081+60 90' Lt. Sta. 4082+05 90' Rt.	2 EA 2 EA 2 EA 2 EA 2 EA 2 EA
	Japanese Tree Lilac Sta. 4089+95 90' Lt. Sta. 4090+30 90' Rt.	2 EA 2 EA
	Colorado Spruce Sta. 4079+90 90' Lt. Sta. 4080+15 90' Rt.	2 EA 2 EA
	Ponderosa Pine Sta. 4084+20 90' Lt. Sta. 4084+85 90' Rt.	2 EA 2 EA



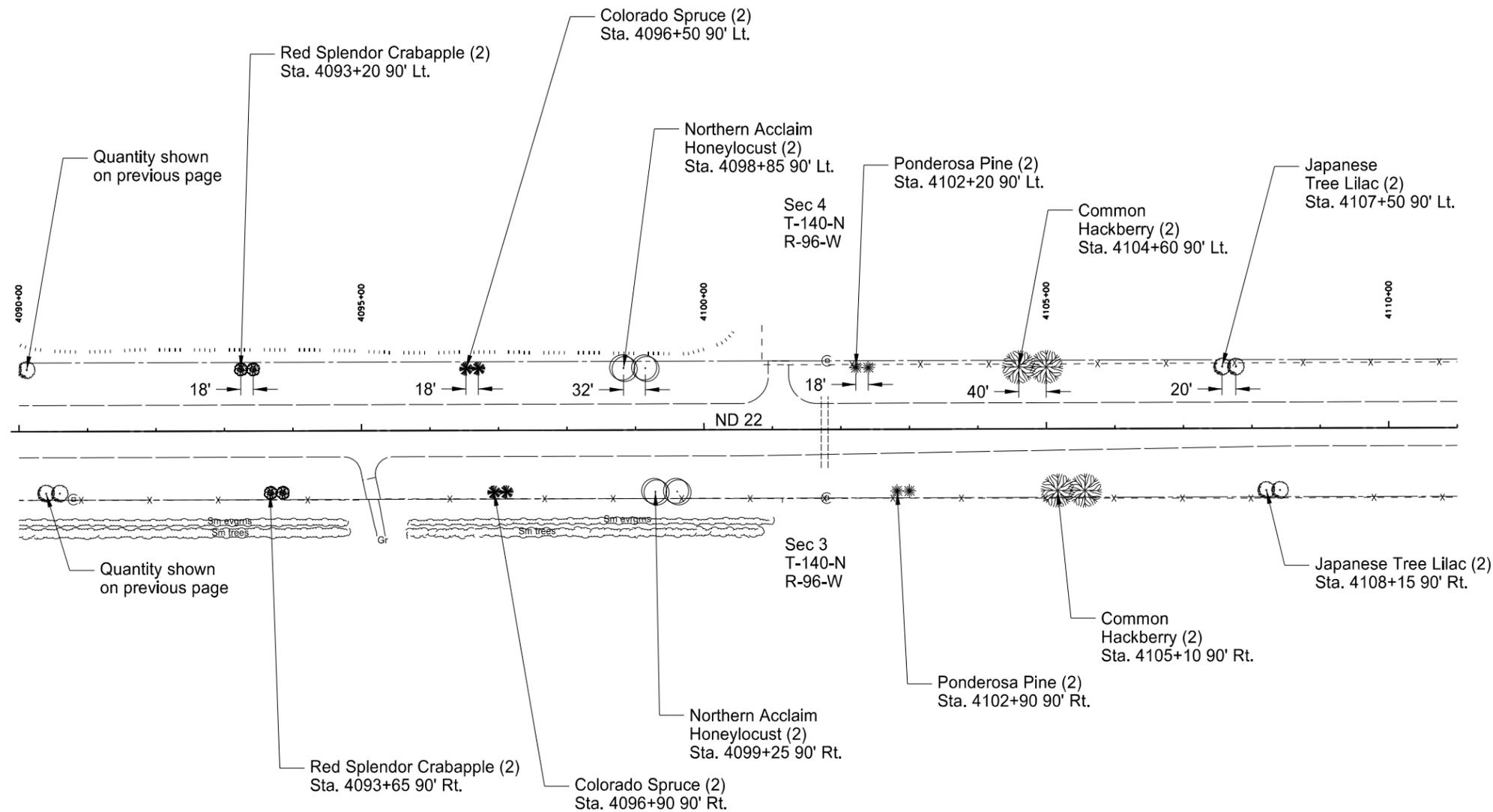
This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 4070+00 - Sta.4090+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	15

	Common Hackberry Sta. 4104+60 90' Lt. Sta. 4105+10 90' Rt.	2 EA 2 EA
	Northern Acclaim Honeylocust Sta. 4098+85 90' Lt. Sta. 4099+25 90' Rt.	2 EA 2 EA
	Red Splendor Crabapple Sta. 4093+20 90' Lt. Sta. 4093+65 90' Rt.	2 EA 2 EA
	Japanese Tree Lilac Sta. 4107+50 90' Lt. Sta. 4108+15 90' Rt.	2 EA 2 EA
	Colorado Spruce Sta. 4096+50 90' Lt. Sta. 4096+90 90' Rt.	2 EA 2 EA
	Ponderosa Pine Sta. 4102+20 90' Lt. Sta. 4102+90 90' Rt.	2 EA 2 EA



This document was originally issued and sealed by
Alexis J. Wallevand
Registration Number
LA- 3,
on 8/23/13 and the original document is stored at the
North Dakota Department
of Transportation

Dickinson Highway 22
Landscape Enhancement Project

Landscape Layout

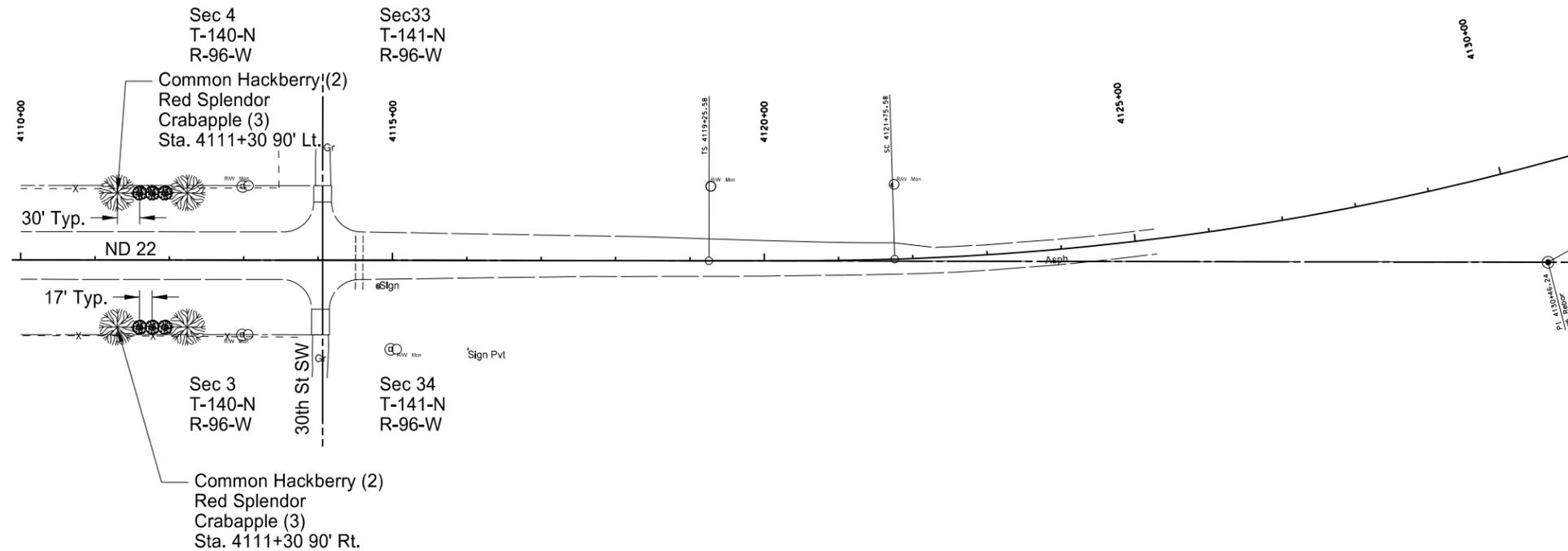
Sta. 4090+00 - Sta.4110+00



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-5-022(115)072	85	16

-  Common Hackberry
 Sta. 4111+30 90' Lt. 2 EA
 Sta. 4111+30 90' Rt. 2 EA
-  Red Splendor Crabapple
 Sta. 4111+30 90' Lt. 3 EA
 Sta. 4111+30 90' Rt. 3 EA

STARK COUNTY DUNN COUNTY



This document was originally issued and sealed by
 Alexis J. Wallevand
 Registration Number
 LA- 3,
 on 8/23/13 and the original document is stored at the
 North Dakota Department
 of Transportation

Dickinson Highway 22
 Landscape Enhancement Project
 Landscape Layout
 Sta. 4110+00 - Sta.4120+00

NDDOT ABBREVIATIONS

Abn	abandoned	BV	butterfly valve	Co	County	EL	electric locker
Abut	abutment	Byp	bypass	Crse	course	E Mtr	electric meter
Ac	acres	C Gdrl	cable guardrail	C Gr	course gravel	Elec	electric/al
Adj	adjusted	Calc	calculate	CS	course sand	EDM	electronic distance meter
Aggr	aggregate	Cd	candela	Ct	Court	Elev or El	elevation
Ahd	ahead	CIP	cast iron pipe	Xarm	cross arm	Ellipt	elliptical
ARV	air release valve	CB	catch basin	Xbuck	cross buck	Emb	embankment
Align	alignment	CRS	cationic rapid setting	Xsec	cross sections	Emuls	emulsion/emulsified
Al	alley	C Gd	cattle guard	Xing	crossing	ES	end section
Alt	alternate	C To C	center to center	Xrd	Crossroad	Engr	engineer
Alum	aluminum	Cl or C	centerline	Crn	crown	ESS	Environmental Sensor Station
A	ampere	Cm	centimeter	CF	cubic feet	Eq	equal
&	and	Ch	chain	M3	cubic meter	Eq	equation
Appr	approach	Chnlk	chain-link	M3/s	cubic meters per second	Evgr	evergreen
Approx	approximate	Ch Blk	channel block	CY	cubic yard	Exc	excavation
ACP	asbestos cement pipe	Ch Ch	channel change	Cy/mi	cubic yards per mile	Exst	existing
Asph	asphalt	Chk	check	Culv	culvert	Exp	expansion
AC	asphalt cement	Chsld	chiseled	C&G	curb & gutter	Expy	Expressway
Assmd	assumed	Cir	circle	CI	curb inlet	E	external of curve
@	at	Cl	class	CR	curb ramp	Extru	extruded
Atten	attenuation	Cl	clay	CS	curve to spiral	FOS	factor of safety
ATR	Automatic Traffic Recorder	Cl F	clay fill	C	cut	F	Fahrenheit
Ave	Avenue	Cl Hvy	clay heavy	Dd Ld	dead load	FS	far side
Avg	average	Cl Lm	clay loam	Defl	deflection	F	farad
ADT	average daily traffic	Clnt	clean-out	Defm	deformed	Fed	Federal
Az	azimuth	Clr	clear	Deg or D	degree	FHWA	Federal Highway Administration
Bk	back	Cl&gr	clearing & grubbing	DInt	delineate	FP	feed point
BF	back face	Co S	coal slack	DIntr	delineator	Ft	feet/foot
Bs	backsight	Comb.	combination	Depr	depression	Fn	fence
Balc	balcony	Coml	commercial	Desc	description	Fn P	fence post
B Wire	barbed wire	Compr	compression	Det	detail	FO	fiber optic
Barr	barricade	CADD	computer aided drafting & design	DWPP	detectable warning panel	FB	field book
Btry	battery	Conc	concrete	Dtr	detour	FD	field drive
Brg	bearing	Cond	conductor	Dia	diameter	F	fill
BI	beehive inlet	Const	construction	Dir	direction	FAA	fine aggregate angularity
Beg	begin	Cont	continuous	Dist	distance	FS	fine sand
BM	bench mark	CSB	continuous split barrel sample	DM	disturbed material	FH	fire hydrant
Bkwy	bikeway	Contr	contraction	DB	ditch block	FI	flange
Bit	bituminous	Contr	contractor	DG	ditch grade	Flrd	flared
Blk	block	CP	control point	Dbl	double	FES	flared end section
Bd Ft	board feet	Coord	coordinate	Dn	down		
BH	bore hole	Cor	corner	Dwg	drawing		
BS	both sides	Corr	corrected	Dr	drive		
Bot	bottom	CAES	corrugated aluminum end section	Drwy	driveway		
Blvd	Boulevard	CAP	corrugated aluminum pipe	DI	drop inlet		
Bndry	boundary	CMES	corrugated metal end section	D	dry density		
BC	brass cap	CMP	corrugated metal pipe	Ea	each		
Brkwy	breakaway	CPVCP	corrugated poly-vinyl chloride pipe	Esmt	easement		
Br	bridge	CSES	corrugated steel end section	E	East		
Bldg	building	CSP	corrugated steel pipe	EB	Eastbound		
BLM	Bureau of Land Management	C	coulomb	Elast	elastomeric		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-20-2

F Bcn	flashing beacon	Hor	horizontal	Long.	longitude	NB	Northbound
FA	flight auger sample	HBP	hot bituminous pavement	Lp	loop	No. or #	number
FL	flow line	Hr	hour(s)	LD	loop detector	Obsc	obscure(d)
Ftg	footing	Hyd	hydrant	Lm	lumen	Obsn	observation
FM	force main	Ph	hydrogen ion content	Lum	luminaire	Ocpd	occupied
Fs	foresight	Id	identification	L Sum	lump sum	Ocpy	occupy
Fnd	found	In or "	inch	Lx	lux	Off Loc	office location
Fdn	foundation	Incl	inclinometer tube	ML	main line	O/s	offset
Frac	fractional	IMH	inlet manhole	M Hr	man hour	OC	on center
Frwy	freeway	ID	inside diameter	MH	manhole	C	one dimensional consolidation
Frt	front	Inst	instrument	Mkd	marked	OC	organic content
FF	front face	Intchg	interchange	Mkr	marker	Orig	original
F Disp	fuel dispenser	Intmdt	intermediate	Mkg	marking	O To O	out to out
FFP	fuel filler pipes	Intscn	intersection	MA	mast arm	OD	outside diameter
FLS	fuel leak sensor	Inv	invert	Matl	material	OH	overhead
Furn	furnish/ed	IM	iron monument	Max	maximum	PMT	pad mounted transformer
Gal	gallon	I Pn	Iron Pin	MC	meander corner	Pg	pages
Galv	galvanized	IP	iron Pipe	Meas	measure	Pntd	painted
Gar	garage	Jt	joint	Mdn	median	Pr	pair
Gs L	gas line	J	joule	MD	median drain	Pnl	panel
G Reg	gas line regulator	Jct	junction	MC	medium curing	Pk	park
GMV	gas main valve	K	kelvin	M	mega	PK	Parker-Kalon nail
G Mtr	gas meter	Kn	kilo newton	Mer	meridian	Pa	pascal
GSV	gas service valve	Kpa	kilo pascal	M	meter	PSD	passing sight distance
GVP	gas vent pipe	Kg	kilogram	M/s	meters per second	Pvmt	pavement
GV	gate valve	Kg/m3	kilogram per cubic meter	M	mid ordinate of curve	Ped	pedestal
Ga	gauge	Km	kilometer	Mi	mile	Ped	pedestrian
Geod	geodetic	K	Kip(s)	MM	mile marker	PPP	pedestrian pushbutton post
GIS	Geographical Information System	LS	Land Surveyor (licensed)	MP	mile post	Pen.	penetration
G	giga	LSIT	Land Surveyor In Training	MI	milliliter	Perf	perforated
GPS	Global Positioning System	Ln	lane	Mm	millimeter	Per.	perimeter
Gov	government	Lg	large	Mm/hr	millimeters per hour	PL	pipeline
Grd	graded/grade	Lat	latitude	Min	minimum	PI	place
Gr	gravel	Lt	left	Misc	miscellaneous	P&P	plan & profile
Grnd	ground	L	length of curve	Mon	monument	PL	plastic limit
GWM	ground water monitor	Lens	lenses	Mnd	mound	PI	plate
Gdrl	guardrail	Lvl	level	Mtbl	mountable	Pt	point
Gtr	gutter	LB	level book	Mtd	mounted	PCC	point of compound curve
H Plg	H piling	LvIng	leveling	Mtg	mounting	PC	point of curve
Hdwl	headwall	Lht	light	Mk	muck	PI	point of intersection
Ha	hectare	LP	light pole	Mun	municipal	PRC	point of reverse curvature
Ht	height	Ltg	lighting	N	nano		
HI	height of instrument	Lig Co	lignite coal	NGS	National Geodetic Survey		
Hel	helical	Lig SI	lignite slack	NS	near side		
H	henry	LF	linear foot	Neop	neoprene		
HZ	hertz	Liq	liquid	Ntwk	network		
HDPE	High Density Polyethylene	LL	liquid limit	N	newton		
HM	high mast	L	litre	N	North		
HP	high pressure	Lm	loam	NDDOT	North Dakota Department of Transportation		
HPS	high pressure sodium	Loc	location	NE	North East		
Hwy	highway	LC	long chord	NW	North West		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

PT	point of tangent	Rdbd	road bed	M2	square meter	TP	traverse point
POC	point on curve	Rdwy	roadway	SY	square yard	Trtd	treated
POT	point on tangent	RWIS	Roadway Weather Information System	Stk	stake	Trmt	treatment
PE	polyethylene	Rk	rock	Std	standard	Qc	triaxial compression
PVC	polyvinyl chloride	Rt	route	N	standard penetration test	TERO	Tribal Employment Rights Ordinance
PCC	Portland Cement concrete	Salv	salvage(d)	Std Specs	Standard Specifications	Tpl	triple
Lb or #	pounds	Sd	sand	Sta	station	TP	turning point
PP	power pole	Sdy Cl	sandy clay	Sta Yd	station yards	Typ	typical
Preempt	preemption	Sdy Cl Lm	sandy clay loam	Stm L	steam line	Qu	unconfined compressive strength
Prefab	prefabricated	Sdy Fl	sandy fill	SEC	steel encased concrete	Ugrnd	underground
Prfmd	performed	Sdy Lm	sandy loam	SSD	stopping sight distance	USC&G	US Coast & Geodetic Survey
Prep	preparation	San	sanitary sewer line	SD	storm drain	USGS	US Geologic Survey
Press.	pressure	Sc	scoria	St	street	Util	utility
PRV	pressure relief valve	Sec	seconds	SPP	structural plate pipe	VG	valley gutter
Prestr	prestressed	Sec	section	SPPA	structural plate pipe arch	Vap	vapor
Pvt	private	SL	section line	Str	structure	Vert	vertical
PD	private drive	Sep	separation	Subd	subdivision	VC	vertical curve
Prod.	production/produce	Seq	sequence	Sub	subgrade	VCP	vitrified clay pipe
Prog	programmed	Serv	service	Sub Prep	subgrade preparation	V	volt
Prop.	property	Sh	shale	Ss	subsoil	Vol	volume
Prop Ln	property line	Sht	sheet	SE	superelevation	Wkwy	walkway
Ppsd	proposed	Shtng	sheeting	SS	supplement specification	W	water content
PB	pull box	Shldr	shoulder	Supp	supplemental	WGV	water gate valve
Qty	quantity	Sw	sidewalk	Surf	surfacing	WL	water line
Qtr	quarter	S	siemens	Surv	survey	WM	water main
Rad or R	radius	SD	sight distance	Sym	symmetrical	WMV	water main valve
RR	railroad	Sig	signal	SI	Systems International	W Mtr	water meter
Rlwy	railway	Si Cl	silt clay	Tan	tangent	WSV	water service valve
Rsd	raised	Si Cl Lm	silty clay loam	T	tangent (semi)	WW	water well
RTP	random traverse point	Si Lm	silty loam	TS	tangent to spiral	W	watt
Rge or R	range	Sgl	single	Tel	telephone	Wrng	wearing
RC	rapid curing	SC	slow curing	Tel B	Telephone Booth	Wb	weber
Rec	record	SS	slow setting	Tel P	telephone pole	WIM	weigh in motion
Rcy	recycle	Sm	small	Tv	television	W	West
RPCC	recycled Portland cement concrete	S	South	Temp	temperature	WB	Westbound
Ref	reference	SE	South East	Temp	temporary	Wrng	wiring
R Mkr	reference marker	SW	South West	TBM	temporary bench mark	W/	with
RM	reference monument	SB	Southbound	T	tesla	W/o	without
Refl	reflectorized	Sp	spaces	T	thinwall tube sample	WC	witness corner
RCB	reinforced concrete box	Spcl	special	T/mi	tons per mile	WGS	World Geodetic System
RCES	reinforced concrete end section	SP	special provisions	Ts	topsoil	Z	zenith
RCP	reinforced concrete pipe	G	specific gravity	Twp or T	township		
RCPS	reinforced concrete pipe sewer	Spk	spike	Traf	traffic		
Reinf	reinforcement	SC	spiral to curve	TSCB	traffic signal control box		
Res	reservation	ST	spiral to tangent	Tr	trail		
Ret	retaining	SB	split barrel sample	Transf	transformer		
Rev	reverse	SH	sprinkler head	TB	transit book		
Rt	right	SV	sprinkler valve	Trans	transition		
R/W	right of way	Sq	square	TT	transmission tower		
Riv	river	SF	square feet	Trans	transverse		
Rd	road	Km2	square kilometer	Trav	traverse		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

NDDOT UTILITY COMPANY ABBREVIATIONS

702COM 702 Communications
 ACCENT Accent Communications
 AGASSIZ WU Agassiz Water Users Incorporated
 All PI Alliance Pipeline
 ALL SEAS WU All Seasons Water Users Association
 AMOCO PI Amoco Pipeline Company
 AMRDA HESS Amerada Hess Corporation
 AT&T AT&T Corporation
 B PAW Bear Paw Energy Incorporated
 BASIN ELEC Basin Electric Cooperative Incorporated
 BEK TEL Bek Communications Cooperative
 BELLE PL Belle Fourche Pipeline Company
 BNSF Burlington Northern Santa Fe Railway
 BOEING Boeing
 BRNS RWD Barnes Rural Water District
 BURK-DIV ELEC Burke-Divide Electric Cooperative
 BURL WU Burleigh Water Users
 Cable One Cable One
 CABLE SERV Cable Services
 CAP ELEC Capital Electric Cooperative Incorporated
 CASS CO ELEC Cass County Electric Cooperative
 CASS RWU Cass Rural Water Users Incorporated
 CAV ELEC Cavalier Rural Electric Cooperative
 CBLCOM Cablecom Of Fargo
 CENEX PL Cenex Pipeline
 CENT PWR ELEC Central Power Electric Cooperative
 CONS TEL Consolidated Telephone
 CONT RES Continental Resource Inc
 CPR Canadian Pacific Railway
 D O E Department Of Energy
 DAK CARR Dakota Carrier Network
 DAK CENT TEL Dakota Central Telephone
 DAK RWD Dakota Rural Water District
 DGC Dakota Gasification Company
 DICKEY R NET Dickey Rural Networks
 DICKEY RWU Dickey Rural Water Users Association
 DICKEY TEL Dickey Telephone
 DNRR Dakota Northern Railroad
 DOME PL Dome Pipeline Company
 DVELEC Dakota Valley Electric Cooperative
 DVMW Dakota, Missouri Valley & Western
 ENBRDG Enbridge Pipelines Incorporated
 FALK MNG Falkirk Mining Company
 G FKS-TRL WD Grand Forks-trail Water District
 GETTY TRD & TRAN Getty Trading & Transportation
 GLDN W ELEC Golden West Electric Cooperative
 GRGS CO TEL Griggs County Telephone
 GT PLNS NAT GAS Great Plains Natural Gas Company
 HALS TEL Halstad Telephone Company
 INT-COMM TEL Inter-Community Telephone Company
 KANEB PL Kaneb Pipeline Company

KEM ELEC Kem Electric Cooperative Incorporated
 KOCH GATH SYS Koch Gathering Systems Incorporated
 LKHD PL Lakehead Pipeline Company
 LNGDN RWU Langdon Rural Water Users Incorporated
 LWR YELL R ELEC Lower Yellowstone Rural Electric
 MCKNZ CON McKenzie Consolidated Telcom
 MCKNZ WRD McKenzie County Water Resource District
 MCKNZ ELEC McKenzie Electric Cooperative
 MCLEOD Mcleod USA
 MCLN ELEC Mclean Electric Cooperative
 MCLN-SHRDN R WAT Mclean-Sheridan Rural Water
 MDU Montana-dakota Utilities
 MID-CONT CABLE Mid-Continent Cable
 MIDSTATE TEL Midstate Telephone Company
 MINOT CABLE Minot Cable Television
 MINOT TEL Minot Telephone Company
 MISS W W S Missouri West Water System
 MNKOTA PWR Minnkota Power
 MRE LBTY TEL Moore & Liberty Telephone
 MOR-GRAN-SOU ELEC Mor-gran-sou Electric Cooperative
 MOUNT-WILLI ELEC Mountrail-williams Electric Cooperative
 MUNICIPAL City Of '.....'
 MUNICIPAL City Water And Sewer
 N CENT ELEC North Central Electric Cooperative
 N VALL W DIST North Valley Water District
 ND PKS & REC North Dakota Parks And Recreation
 ND TEL North Dakota Telephone Company
 NDDOT North Dakota Department of Transportation
 NDSU SOIL SCI DEPT Ndsu Soil Science Department
 NEMONT TEL Nemont Telephone
 NODAK R ELEC Nodak Rural Electric Cooperative
 NOON FRMS TEL Noonan Farmers Telephone Company
 NPR Northern Plains Railroad
 NSP Northern States Power
 NTH PRAIR RW Northern Prairie Rural Water Association
 NTHN BRDR PL Northern Border Pipeline
 NTHN PLNS ELEC Northern Plains Electric Cooperative Incorporated
 NTHWSTRN REF Northwestern Refinery Company
 NW COMM Northwest Communication Cooperation
 OTTR TL PWR Otter Tail Power Company
 P L E M Prairielands Energy Marketing
 POLAR COM Polar Communications
 QWEST Qwest Communications
 R&T W SUPPLY R & T Water Supply Association
 RAMSEY R SEW Ramsey Rural Sewer Association
 RAMSEY RW Ramsey Rural Water Association
 RAMSEY UTIL Ramsey County Rural Utilities
 RED RIV TEL Red River Rural Telephone
 RESVTN TEL Reservation Telephone
 ROBRTS TEL Roberts Company Telephone
 R-RIDER ELEC Roughrider Electric Coop

RRVW Red River Valley & Western Railroad
 RSR ELEC R.S.R. Electric Cooperative
 S E W U South East Water Users Incorporated
 SCOTT CABLE Scott Cable Television Dickinson
 SHERDN ELEC Sheridan Electric Cooperative
 SHEYN VLY ELEC Sheyenne Valley Electric Cooperative
 SKYTECH Skyland Technologies Incorporated
 SLOPE ELEC Slope Electric Cooperative
 SLOPE ELEC Slope Electric Cooperative Incorporated
 SOURIS RIV TELCOM Souris River Telecommunications
 ST WAT COMM State Water Commission
 STATE LN WATER State Line Water Cooperative
 STUT RWU Stutsman Rural Water Users
 T M C Turtle Mountain Communications
 TCI TCI of North Dakota
 TRI-CNTY WU Tri-County Water Users Incorporated
 TRL CO RWU Traill County Rural Water Users
 UNTD TEL United Telephone
 UPPR SOUR WUA Upper Souris Water Users Association
 US SPRINT U.S. Sprint
 USAF MSL CABLE U.S.A.F. Missile Cable
 USW COMM U.S. West Communications
 VRNDRY ELEC Verendrye Electric Cooperative
 W RIV TEL West River Telephone Incorporated
 WEB W. E. B. Water Development Association
 WILLI RWA Williams Rural Water Association
 WILSTN BAS PL Williston Basin Interstate Pipeline Company
 WLSH RWD Walsh Water Rural Water District
 WOLVRTN TEL Wolverton Telephone
 XLENER Xcel Energy
 YSVR Yellowstone Valley Railroad

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
6-15-10	
REVISIONS	
DATE	CHANGE
04-20-11 03-15-13	Added Items Added Items

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 3/15/13 and the original document is stored at the North Dakota Department of Transportation

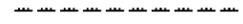
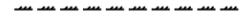
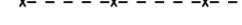
Line Styles

.....	Limits of Const Transition Line	—— s —— s ——	Floating Silt Curtain	—— ——— ———	Existing Aggregate (Cross Section View)	- - - - -	Existing Centerline
.....	Bale Check	—— ——— T ——	Existing Telephone Line	—— ——— ———	Existing Curb and Gutter (Cross Section View)	- - - - -	Supplemental Contour
.....	Rock Check	—— ——— TV ——	Existing TV Line	—— ——— ———	Existing Riprap	—— - - - - -	Right of Way
.....	Sight Distance Triangle Line	Void — void — void — v	Existing Assumed Ground (Not Surveyed)	—— ——— ———	Existing Underground Vault or Lift Station	—— - - - - -	Existing Right of Way
- - - - -	Small Hidden Object	Void — void — void — v	Tentative Ground Line	—— ——— ———	Tangent Line	—— - - - - -	Existing Right of Way Railroad
- - - - -	Dimension Leader	—— ——— w ——	Existing Water or Steam Line	- - - - -	Hidden Object	- - - - -	Failure Line
- - - - -	Existing Ground	=====	Existing Under Drain	—— ——— ———	Existing Dirt Surface	- - - - -	Existing Conditions
- - - - -	Existing Topsoil (Cross Section View)	=====	Under Drain	—— ——— ———	Existing Conduit	- - - - -	Existing Ground (Details)
—— ——— ———	Large Hidden Object	=====	Wall	—— ——— ———	Topsoil Profile	—— - - - - -	Existing Sixteenth Section Line
—— ——— ———	Edge Drain	=====	Existing Slotted Drain	- - - - -	Existing Conductor	- - - - -	Existing Right of Way Not State Owned
—— D —— D ——	Geotextile Fabric Type D	—— + —— + ——	Existing Cemetary Boundary	- - - - -	Conductor	- - - - -	Phantom Object
—— ——— E ——	Existing Electrical	—— ——— ———	Centerline Pavement Marking	- - - - -	Fiber Optic	- - - - -	Centerline Main
—— ——— FO ——	Existing Fiber Optic Line	=====	Barrier with Centerline Pavement Marking	- - - - -	Existing Loop Detector	-	Existing Guardrail Cable
—— ——— FO ——	Existing TV Fiber Optic	=====	Barrier Pavement Marking	- - - - -	Subgrade, Subcut or Ditch Grade	— • — • — • — •	Existing Guardrail Metal
—— ——— G ——	Existing Gas Pipe	- - - - -	Stripe 4 IN Dotted Extension White	—— ——— ———	Existing Asphalt Surface	—— . ——— . ——— . ——— .	Existing Edge of Water
—— Geo —— Geo ——	Geogrid	- - - - -	Stripe 8 IN Dotted Extension White	—— ——— ———	Existing Asphalt (Cross Section View)	- - - - -	Excavation Limits
—— ——— OH ——	Existing Overhead Utility Line	- - - - -	Stripe 8 IN Lane Drop	—— ——— ———	Existing Reinforcement Rebar	——	Existing Government Lot Line
—— ——— P ——	Existing Power	—— v v v v ——	Wetland Mitigation	—— ——— ———	Existing Tie Point Line	.....	Existing Adjacent Block Lines
—— ——— PL ——	Existing Fuel Pipeline	- - - - -	Existing Box Culvert Bridge	—— ——— ———	Existing State or International Line	.....	Existing Adjacent Lot Lines
—— ——— PL ——	Existing Undefined Above Ground Pipe Line	- - - - -	Existing Concrete Surface	—— ——— ———	Existing Quarter Section Line	.....	Existing Adjacent Property Line
—— ——— R —— R ——	Geotextile Fabric Type R	- - - - -	Existing Drainage Structure	—— ——— ———	Existing County	.....	Existing Adjacent Subdivision Lines
—— ——— R —— R ——	Geotextile Fabric Type R1	- - - - -	Easement	—— ——— ———	Existing Section Line	.....
—— REMOVE —— REMOVE ——	Remove Line	- - - - -	Existing Concrete	—— ——— ———	Existing Township	.....
—— RR —— RR ——	Geotextile Fabric Type RR	- - - - -	Existing Easement	—— ——— ———	Existing Railroad Centerline	.....
—— S —— S ——	Geotextile Fabric Type S	—— ——— ———	Existing Gravel Surface	—— - - - - -	Centerline	.....

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Line Styles

	Subgrade Reinforcement		Existing Railroad Switch		Sheet Piling
	Existing Down Guy Wire Down Guy		Overhead Sign Structure Cantilever		W-Beam w Posts
	Existing Fence		24 Inch Pipe		Existing W-Beam Guardrail with Posts
	Existing Railroad		Reinforced Concrete Pipe		Exst Wet Area-Vegetation Break
	Existing Sanitary Sewer		Signal Head with Mast Arm		Existing Wetland Delineated
	Existing Sanitary Force Main		Existing Signal Head with Mast Arm		
	Existing Storm Drain		Tie Bar at Random Spacing		
	Existing Storm Drain Force Main		3-Cable w Posts		
	Fence		Existing 3-Cable w Posts		
	Silt Fence		Site Boundary		
	Existing Field Line		Fiber Rolls		
	Exst Flow		Doweled Joint		
	Flow		Tie Bar 30 Inch 4 Foot Center to Center		
	Existing Culvert		Tie Bar 18 Inch 3 Foot Center to Center		
	Existing Curb		Existing Berm, Dike, Pit, or Earth Dam		
	Existing Valley Gutter		Existing Ditch Block		
	Existing Driveway Gutter		Depression Contours		
	Existing Curb and Gutter		Existing City Corporate Limits or Reservation Boundary		
	Existing Mountable Curb and Gutter		Gravel Pit - Borrow Area		
	Existing Double Micro Loop Detector		Existing Tree Boundary		
	Micro Loop Detector Double		Tree Row		
	Existing Overhead Sign Structure		Existing Brush or Shrub Boundary		
	Existing Micro Loop Detector		Existing Retaining Wall		
	Micro Loop Detector		Existing Planter or Wall		
	Existing Overhead Sign Structure Cantilever		Retaining Wall (Plan View)		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Symbols

	North Arrow (Half Scale)		Attenuation Device		Existing Railroad Battery Box		Existing Delineator Type E
	Truck Mounted Attenuator		Diamond Grade Delineator Type A		Existing Bush or Shrub		Existing EFB Misc
	Type I Barricade		Diamond Grade Delineator Type B		Existing Gas Cap or Stub		Existing Flashing Beacon
	Type II Barricade		Diamond Grade Delineator Type C		Existing Sanitary Cap or Stub		Existing Pipe Mounted Flasher
	Type III Barricade		Diamond Grade Delineator Type D		Existing Storm Drain Cap or Stub		Existing Pad Mounted Feed Point
	Catch Basin		Diamond Grade Delineator Type E		Existing Water Cap or Stub		Existing Pipe Mounted Feed Point with Pad
	Cairn or Stone Circle		Flexible Delineator		Existing Sanitary Cleanout		Existing Pole Mounted Feed Point
	Video Detection Camera		Flexible Delineator Type A		Existing Concrete Foundation		Existing Railroad Frog
	Storm Drain Cap or Stub		Flexible Delineator Type B		Existing Traffic Signal Controller		Existing Snow Gate 18
	Corrugated Metal End Section 18 Inch		Flexible Delineator Type C		Existing Pad Mounted Signal Controller		Existing Snow Gate 28
	Corrugated Metal End Section 24 Inch		Flexible Delineator Type D		Existing Sixteenth Section Corner		Existing Snow Gate 40
	Corrugated Metal End Section 30 Inch		Flexible Delineator Type E		Existing Quarter Section Corner		Existing Headwall
	Corrugated Metal End Section 36 Inch		Delineator Type A		Existing Section Corner		Existing Pedestrian Head with Number
	Corrugated Metal End Section 42 Inch		Delineator Type A Reset		Existing Railroad Crossbuck		Existing Signal Head
	Corrugated Metal End Section 48 Inch		Delineator Type B		Existing Satellite Dish		Existing Sprinkler Head
	Concrete Foundation		Delineator Type B Reset		Existing Fuel Dispensers		Existing Fire Hydrant
	Ground Connection Conductor		Delineator Type C		Existing Flexible Delineator Type A		Existing Catch Basin Drop Inlet
	Neutral Connection Conductor		Delineator Type D		Existing Flexible Delineator Type B		Existing Curb Inlet
	Phase 1 Connection Conductor		Delineator Type E		Existing Flexible Delineator Type C		Existing Manhole Inlet
	Phase 2 Connection Conductor		Delineator Drums		Existing Flexible Delineator Type D		Existing Junction Box
	Traffic Cone		Spot Elevation		Existing Flexible Delineator Type E		
	Signal Controller		Existing Access Control Arrow		Existing Delineator Type A		
	Pad Mounted Signal Controller		Existing Artifact		Existing Delineator Type B		
	Alignment Data Point		Existing Flashing Beacon		Existing Delineator Type C		
	Emergency Vehicle Detector		Existing Benchmark		Existing Delineator Type D		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 4/20/11 and the original document is stored at the North Dakota Department of Transportation

Symbols

D-20-31

 Existing Light Standard	 Existing Manhole with Valve Water	 Existing Telephone Pole	 Existing Undefined Manhole
 Existing High Mast Light Standard 10 Luminaire	 Existing Water Manhole	 Existing Wood Pole	 Existing Undefined Pull Box
 Existing High Mast Light Standard 3 Luminaire	 Existing Mile Post Type A	 Existing Post	 Existing Undefined Pedestal
 Existing High Mast Light Standard 4 Luminaire	 Existing Mile Post Type B	 Existing Pedestrian Push Button Post	 Existing Undefined Valve
 Existing High Mast Light Standard 5 Luminaire	 Existing Mile Post Type C	 Existing Control Point CP	 Existing Undefined Pipe Vent
 Existing High Mast Light Standard 6 Luminaire	 Existing Reference Marker	 Existing Control Point GPS-RTK	 Existing Gas Valve
 Existing High Mast Light Standard 7 Luminaire	 Existing RW Marker	 Existing Control Point TRI	 Existing Water Valve
 Existing High Mast Light Standard 8 Luminaire	 Existing Utility Marker	 Existing Reference Marker Point NGS	 Existing Fuel Pipe Vent
 Existing High Mast Light Standard 9 Luminaire	 Existing Monument Found	 Existing Pull Box	 Existing Gas Pipe Vent
 Existing Overhead Sign Structure Load Center	 Existing Monument set	 Existing Intelligent Transportation Pull Box	 Existing Sanitary Pipe Vent
 Existing Luminaire	 Existing RW Property Monument Found	 Existing Water Pump	 Existing Storm Drain Pipe Vent
 Existing Light Standard Luminaire	 Existing RW Property Monument set	 Existing Slotted Reinforced Concrete Pipe	 Existing Water Pipe Vent
 Existing Federal Mailbox	 Existing Object Marker Type I	 Existing RR Profile Spot	 Existing Weather Station
 Existing Private Mailbox	 Existing Object Marker Type II	 Existing Fuel Leak Sensors	 Existing Ground Water Well Bore Hole
 Existing Meander Section Corner	 Existing Object Marker Type III	 Existing Highway Sign	 Existing Windmill or Tower
 Existing Meter	 Existing Electrical Pedestal	 Existing Miscellaneous Spot	 Existing Witness Corner
 Existing Electrical Manhole	 Existing Telephone Pedestal	 Existing Lighting Standard Pole	 Flashing Beacon
 Existing Gas Manhole	 Existing Fiber Optic Telephone Pedestal	 Existing Traffic Signal Standard	 Flagger
 Existing Sanitary Manhole	 Existing TV Pedestal	 Existing Transformer	 Pipe Mounted Flasher
 Existing Sanitary Force Main Manhole	 Existing Fiber Optic TV Pedestal	 Existing Large Evergreen Tree	 Sanitary Force Main with Valve
 Existing Sanitary Manhole with Valve	 Existing Fuel Filler Pipes	 Existing Small Evergreen Tree	
 Existing Storm Drain Manhole	 Existing Traverse PI Aerial Panel	 Existing Large Tree	
 Existing Force Main Storm Drain Manhole	 Existing Pole	 Existing Small Tree	
 Existing Force Main Storm Drain Manhole with Valve	 Existing Power Pole	 Existing Tree Trunk	
 Existing Telephone Manhole	 Existing Power Pole with Transformer	 Existing Pad Mounted Traffic Signal Control Box	

NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by
 Roger Weigel,
 Registration Number
 PE-2930,
 on 4/20/11 and the original document is stored at the
 North Dakota Department
 of Transportation

Symbols

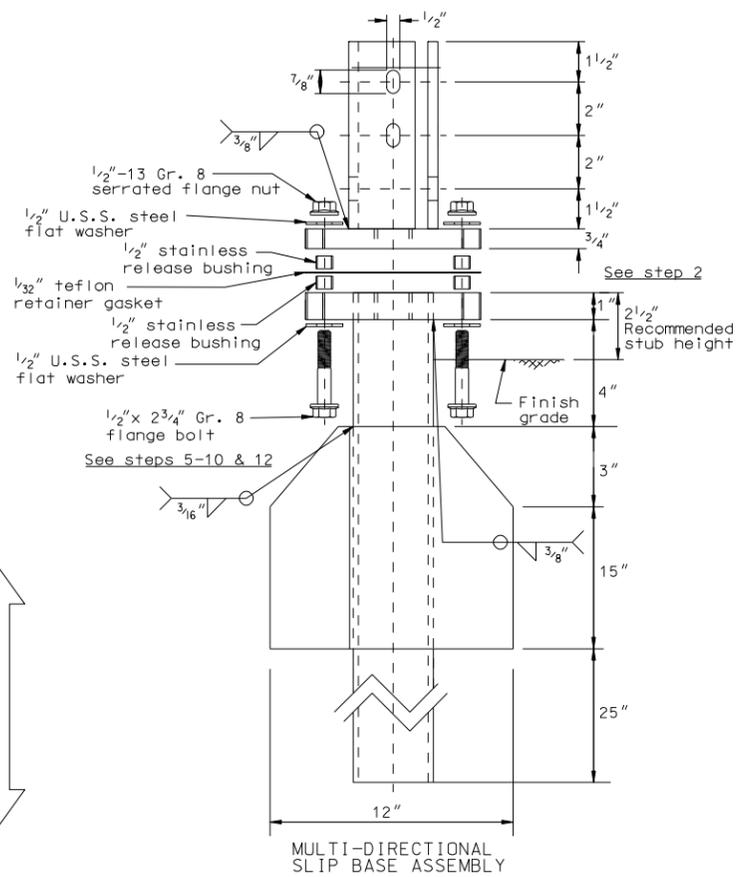
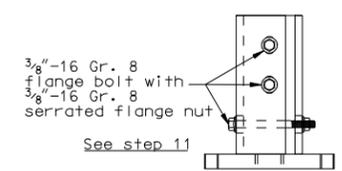
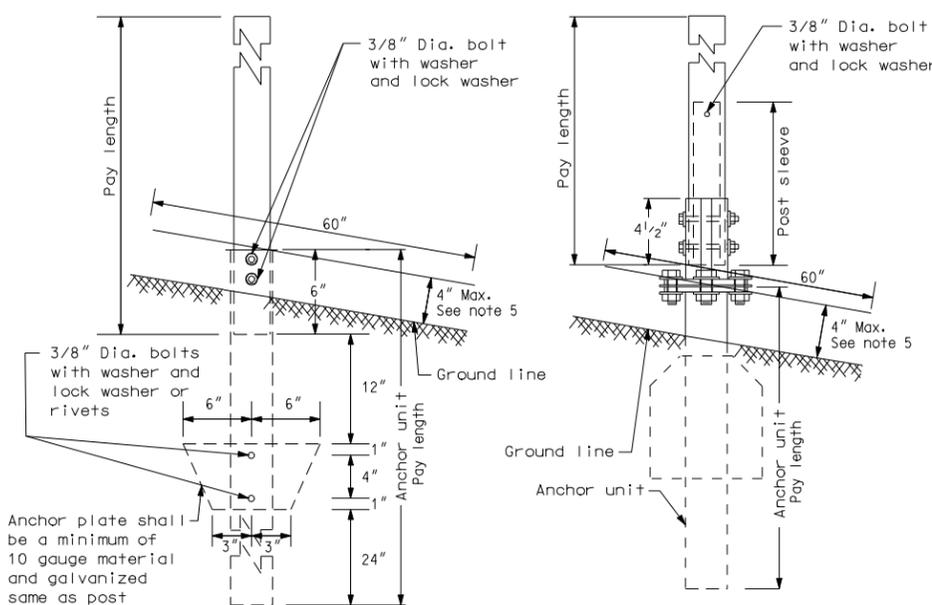
 Pad Mounted Feed Point  Pipe Mounted Feed Point with Pad  Pole Mounted Feed Point  Headwall  Double Headwall with Vegetation Barrier  Single Headwall with Vegetation Barrier  Pole Mounted Head  Sprinkler Head  Fire Hydrant  Inlet Type 1  Inlet Type 2  Double Inlet Type 2  Inlet Gate Type 2  Junction Box  High Mast Light Standard 10 Luminaire  High Mast Light Standard 3 Luminaire  High Mast Light Standard 4 Luminaire  High Mast Light Standard 5 Luminaire  High Mast Light Standard 6 Luminaire  High Mast Light Standard 7 Luminaire  High Mast Light Standard 8 Luminaire  High Mast Light Standard 9 Luminaire  Relocate Light Standard  Overhead Sign Structure Load Center  Light Standard 100 Watt High Pressure Sodium Vapor Luminaire	 Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire  Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  Light Standard 175 Watt High Pressure Sodium Vapor Luminaire  Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  Light Standard 35 Watt High Pressure Sodium Vapor Luminaire  Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  Light Standard 50 Watt High Pressure Sodium Vapor Luminaire  Light Standard 70 Watt High Pressure Sodium Vapor Luminaire  Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  Manhole  Manhole 48 Inch  Sanitary Force Main Manhole  Sanitary Sewer Manhole  Storm Drain Manhole  Storm Drain Manhole with Inlet  Reset Mile Post  Mile Post Type A  Mile Post Type B  Mile Post Type C  Right of Way Marker  Tubular Marker  Concrete Monument to Be Set  RW Property Monument to Be Set	 Object Marker Type I  Object Marker Type II  Object Marker Type III  Caution Mode Arrow Panel  Back to Back Vertical Panel Sign  Double Direction Arrow Panel  Left Directional Arrow Panel  Right Directional Arrow Panel  Sequencing Arrow Panel  Truck Mounted Arrow Panel  Power Pole  Wood Pole  Pedestrian Push Button Post  Property Corner  Pull Box  Intelligent Transportation Pull Box  Sanitary Pump  Storm Drain Pump  Reinforced Pavement  Reinforced Concrete End Section 15 Inch  Reinforced Concrete End Section 18 Inch  Reinforced Concrete End Section 24 Inch  Reinforced Concrete End Section 30 Inch  Reinforced Concrete End Section 36 Inch  Reinforced Concrete End Section 42 Inch	 Reinforced Concrete End Section 48 Inch  Reinforced Concrete End Section 54 Inch  Reset Right of Way Marker  Reset USGS Marker  Right of Way Markers  Riser 30 Inch  Continuous Split Barrel Sample  Flight Auger Sample  Split Barrel Sample  Thinwall Tube Sample  Highway Sign  SNOW GATE 18 FT  SNOW GATE 28 FT  SNOW GATE 40 FT  Standard Penetration Test  Transformer  Inclinometer Tube  Underdrain Cleanout  Excavation Unit  Water Valve
---	--	---	--

NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

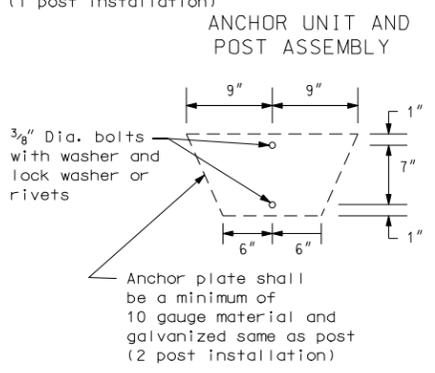
This document was originally issued and sealed by
Roger Weigel,
 Registration Number
PE-2930,
 on **4/20/11** and the original document is stored at the
 North Dakota Department
 of Transportation

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

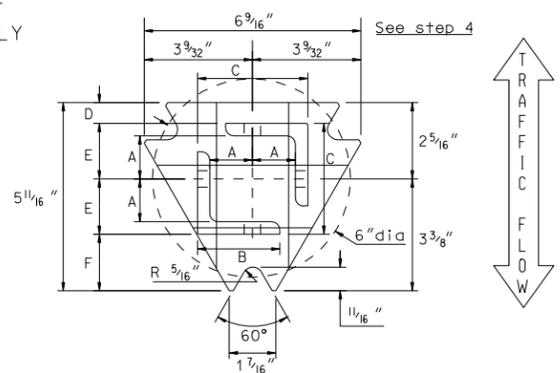
PERFORATED TUBE



- Notes
1. Slip base bolts shall be torqued as specified by the manufacturer.
 2. The 2 3/16 inch size 10 gauge is shown as 2.19 inch size on the plans. The 2 1/2 inch size 10 gauge is shown as 2.51 inch size on the plans.
 3. Anchor for 2 inch, 2 1/4 inch, and 2 1/2 inch posts.
 4. Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3 inch x 3 inch x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
 5. 4 inch vertical clearance of anchor or breakaway base. The 4 inch x 60 inch measurement shall be made above and below post location and also back and ahead of post.
 6. When used in concrete sidewalk, anchor shall be the same except without the wings.
 7. Four post signs shall have over 8 feet between the first and fourth posts.



ANCHOR UNIT AND POST ASSEMBLY

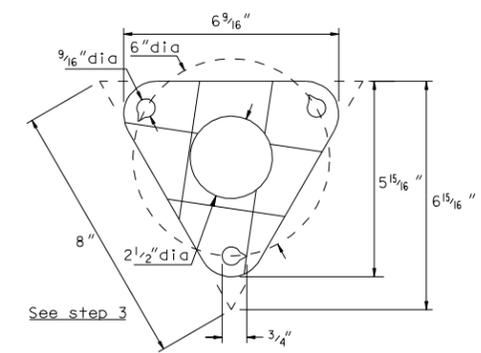


TOP POST RECEIVER

Materials: Plate - ASTM A572 grade 50
Angle receiver - 2 1/2 inch x 2 1/2 inch x 3/8 inch ASTM A36 structural angle

TOP POST RECEIVER DATA TABLE						
Square Post Sizes	A	B	C	D	E	F
2 3/16 inch x 10 Ga. Square Post	1 3/64 inch	2 1/2 inch	3 1/32 inch	2 5/32 inch	1 33/64 inch	1 7/8 inch
2 1/2 inch x 10 Ga. Square Post	1 3/32 inch	2 1/2 inch	3 5/16 inch	5/8 inch	1 21/32 inch	1 3/4 inch

2 3/16 inch x 10 gauge may be inserted into 2 1/2 inch x 10 gauge for additional wind load.

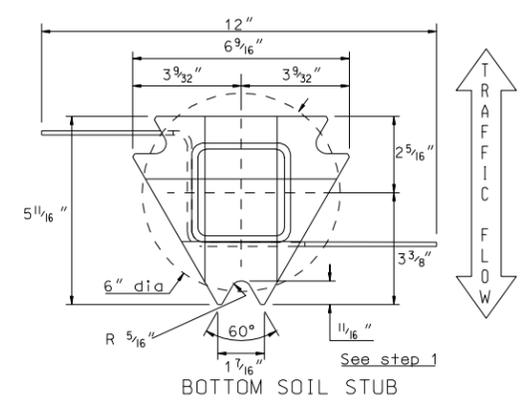


BOLT RETAINER FOR BASE CONNECTION
Materials: 1/32 inch reprocessed Teflon

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			B	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	10			Yes	
2	2 1/4	12	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

B - The 2 1/2 inch, 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

MULTI-DIRECTIONAL SLIP BASE ASSEMBLY	
STEP	INSTALLATION PROCEDURE
1.	Install bottom soil anchor stub plumb and squared up with road, with point of plate facing oncoming traffic.
2.	Depth of imbedment to leave 2 1/2 inch from grade to top of anchor plate.
3.	Place teflon bolt retainer gasket on top of bottom plate (make sure that notches in holes are pointing counter clockwise).
4.	Place top post receiver on to retainer gasket, properly indexed so that angle receivers are squared up with road.
5.	Slide 1 each 1/2 inch flat washer on to 1 each inverted 1/2 - 13 gr. 8 flange bolt, followed by 1 each stainless steel release bushing.
6.	Insert above bolt with washer and bushing up through notched points of top and bottom plates, passing through hole in gasket.
7.	Slide second bushing down on to above bolt until it rests on top of gasket followed by second washer.
8.	Complete by threading 1/2 - 13 gr. 8 serrated flange nut snugly down against top of washer.
9.	Repeat steps 5, 6, 7 & 8 at the two remaining notched triangle points.
10.	Insert sign post into angle receivers on top half until post(s) bottom out. *NOTE: Where higher wind load is desired, insert the next size smaller square post inside bottom of main upright post (Minimum of 48 inch, not to exceed beyond bottom edge of sign).
11.	Secure posts into receivers using 3 each 3/8 - 16 gr. 8 flange bolts and 3 each 3/8 - 16 serrated flange nuts in receiver slots (top 2 bolts should be parallel to highway) do not tighten nuts until all bolts are in place.
12.	After all sub-assembly hardware is tightened, then torque the three 1/2 - 13 nuts to 42 ft-lbs, in a circular pattern until all bolt assemblies reach the required torque. *NOTE: On multi-leg installations, be sure that all anchors are squared and lined up with each other.



BOTTOM SOIL STUB
Materials: Tube - 3 inch x 3 inch x 7 gauge ASTM A500 Gr B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A 569
Plate - ASTM A572 grade 50

Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. 4	Cross Sect. Area In. 2	Section Modulus In. 3
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785
4 x 4	0.250	1/4	6.600	3.040	1.940	1.050

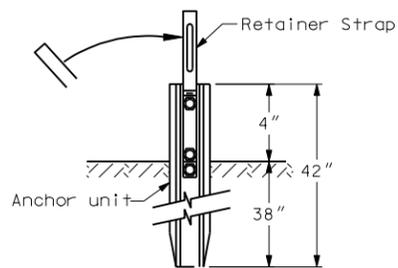
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-21-02	
REVISIONS	
DATE	CHANGE
12-01-04	PE stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

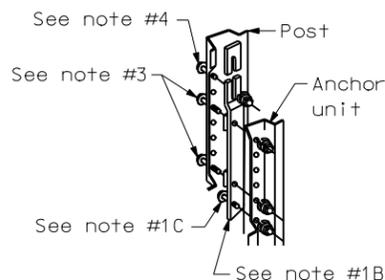
FLANGED CHANNEL



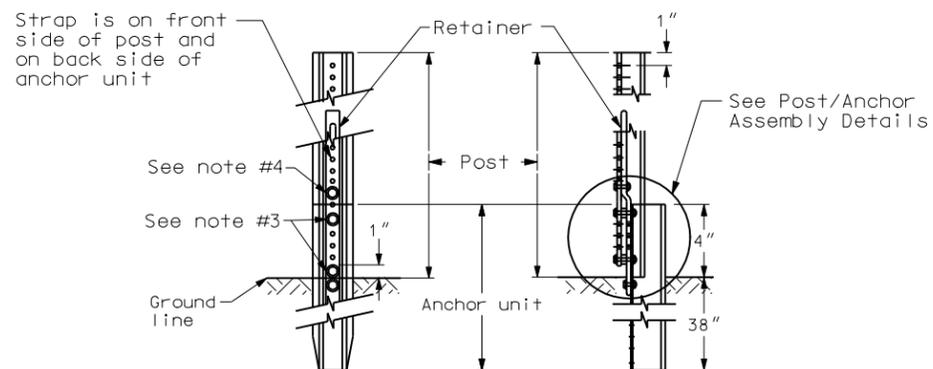
Anchor Unit & Strap Assembly Detail

STEPS OF INSTALLATION

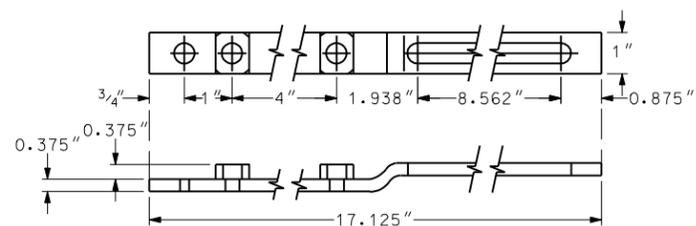
1. A) Drive anchor unit to within 12" of ground level.
- B) Proper assembly established by lining up the top 3/4" slot of retainer spacer strap with top hole of anchor unit.
- C) Assemble strap to back of anchor unit using 3/8"-16 UNC x 2.0" long bolt, lock washer and nut.
- D) Rotate strap 90° to left.
2. A) Drive anchor unit to 4" dimension.
- B) Rotate strap to vertical position.
3. A) Place 3/8"-16 UNC x 2" bolt, lock washer & nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit (this coincides with the bottom 3/4" slot in the strap).
- B) Alternately tighten two connector bolts.
4. A) Complete assembly by tightening 3/8"-16 UNC x 2" long retainer bolt (this fastens sign post to retainer spacer strap).
5. The base post, strap & sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap and sign post at the bolts have full contact across the entire width.



Post/Anchor Assembly Details



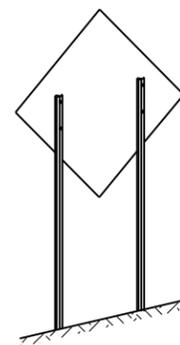
Front View Side View Sign Post Assembly Detail



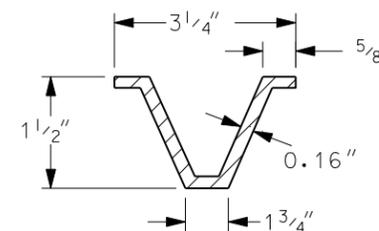
Retainer/Spacer Strap Detail

CHANNEL SIZE IN.	WALL THICKNESS IN.	WEIGHT PER FOOT LBS.	MOMENT OF INERTIA IN. 4	CROSS SECT. AREA IN. SQ.	SECTION MODULUS IN. 3
1.516 x 3.125"	.116	2.00	.179	.590	.225
1.532 x 3.125"	.124	2.25	.201	.648	.254
1.562 x 3.125"	.132	2.50	.233	.748	.289
1.578 x 3.125"	.140	2.75	.271	.819	.329
1.750 x 3.500"	.150	3.00	.372	.918	.403
1.750 x 3.500"	.175	4.00	.500	1.190	.560

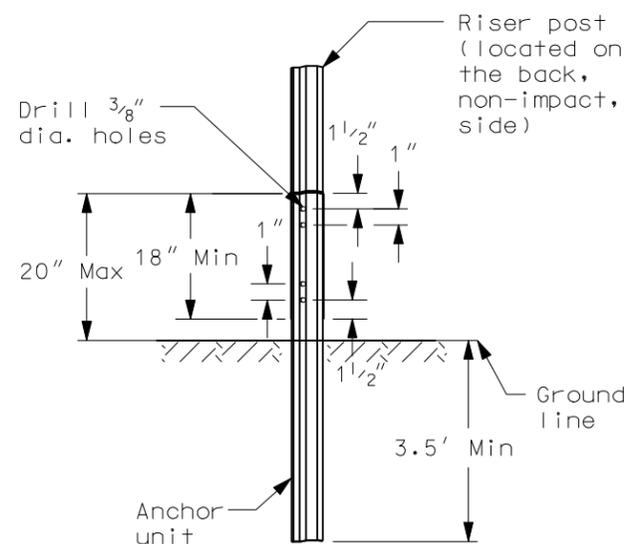
3 LB/FT U POSTS



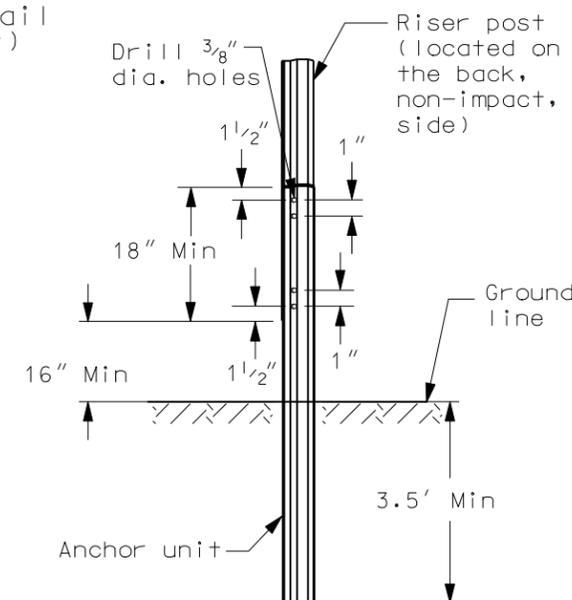
Typical Installation



U-Post Detail (3 lb/ft)



U-Channel Splice Option 1



U-Channel Splice Option 2

Notes

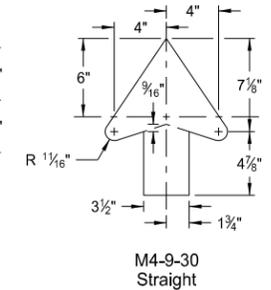
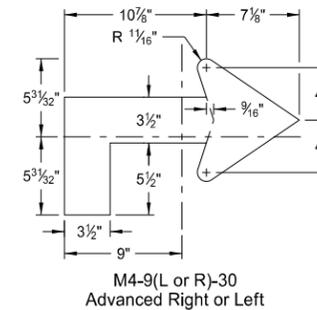
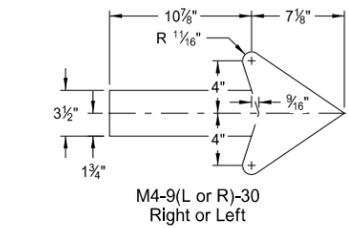
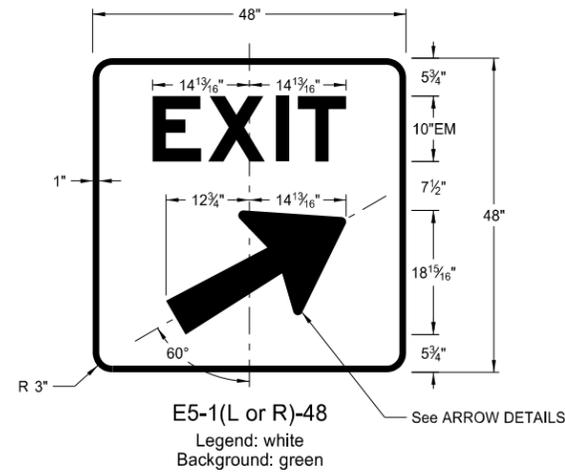
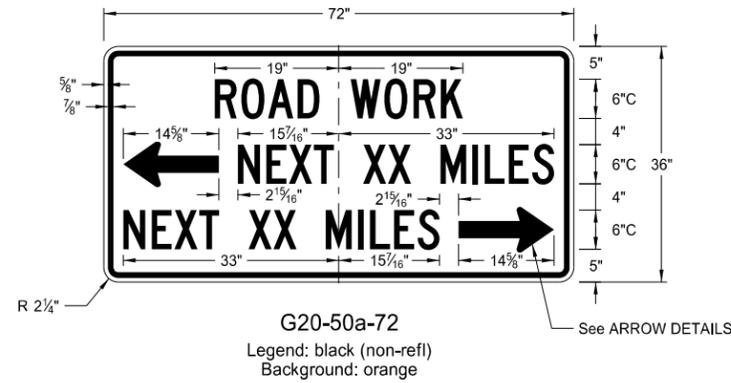
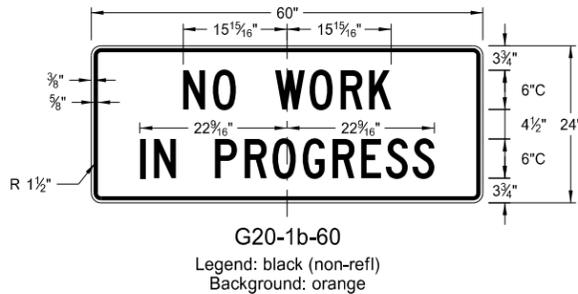
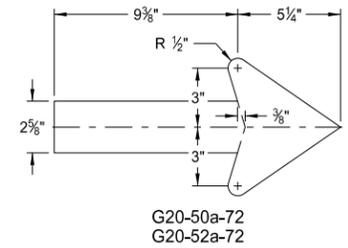
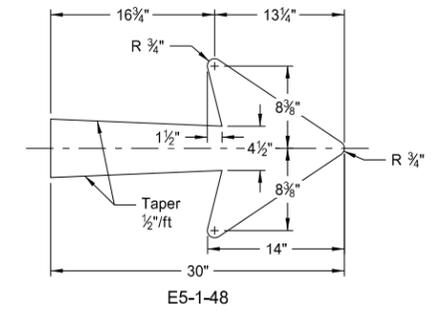
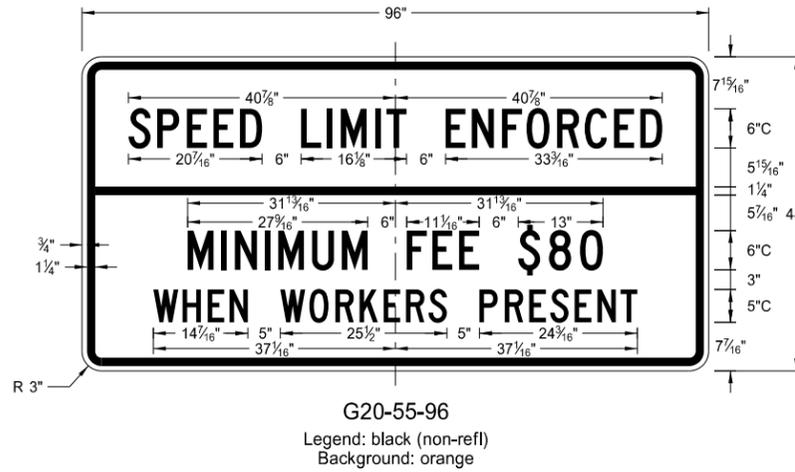
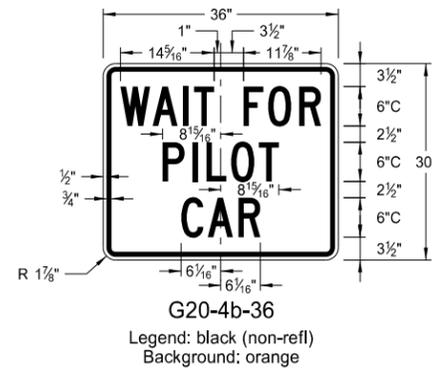
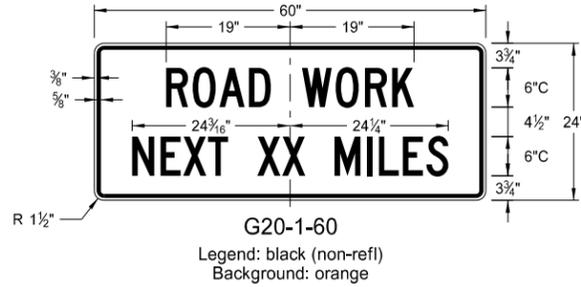
1. Use 3 lb/ft riser anchor units and risers
2. Driven riser posts shall be at least 7' long and embedded at least 3.5'.
3. A splice shall overlap a minimum of 18".
4. Use 4 bolts 5/16" diameter with washers and nuts. Two at top and two at bottom of splice.
5. Anchor unit for guy wires shall be no more than 4" above ground and embedded at least 3.5'.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-28-93	
REVISIONS	
DATE	CHANGE
03-07-01	Revised U-post details
11-21-02	Deleted perforated tube
05-08-03	Revised U-Channel splice
12-01-04	PE stamp added
06-29-05	Revised flanged channel note

This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

D-704-9



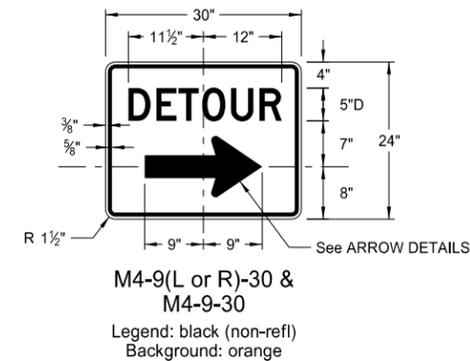
ARROW DETAILS

NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

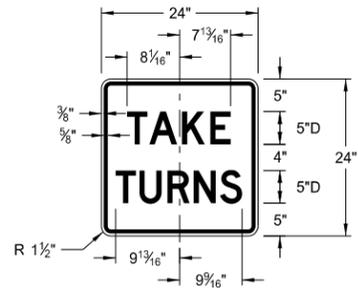
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation



CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

D-704-10



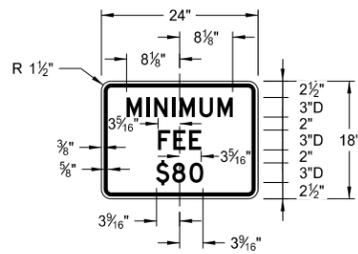
R1-50-24

Legend: black (non-refl)
Background: white



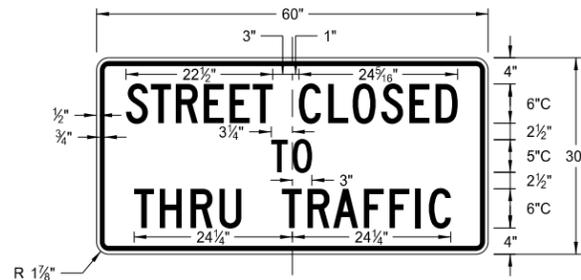
R11-3c-60

Legend: black (non-refl)
Background: white



R2-1a-24

Legend: black (non-refl)
Background: white



R11-4a-60

Legend: black (non-refl)
Background: white



R11-2a-48

Legend: black (non-refl)
Background: white

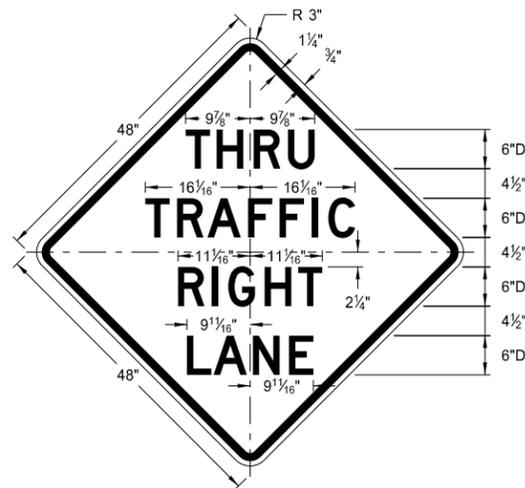
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

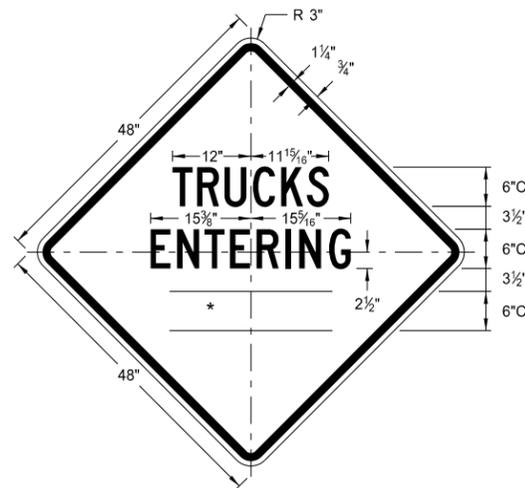
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

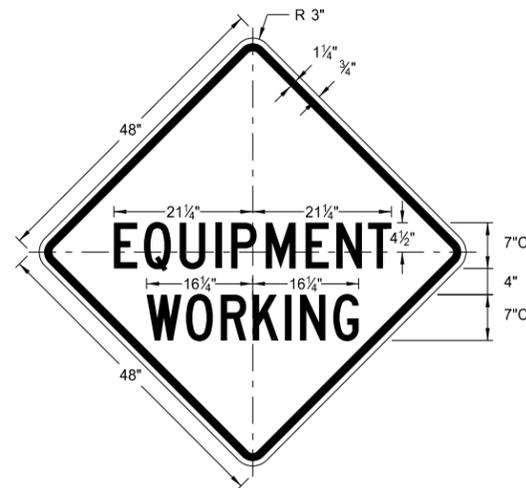
* DISTANCE MESSAGES



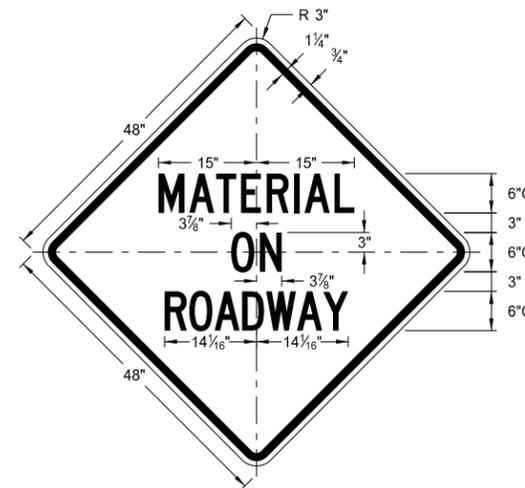
W5-8-48
Legend: black (non-refl)
Background: orange



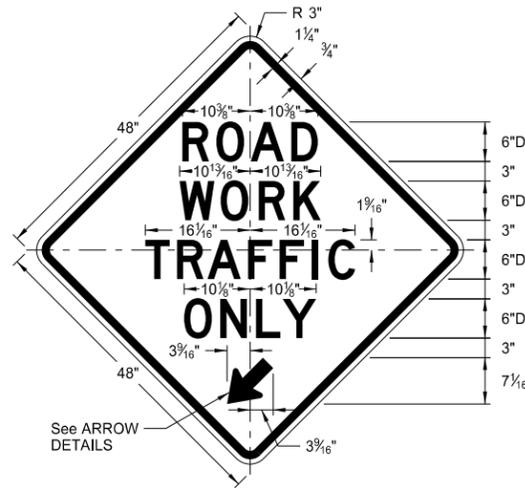
W8-54-48
Legend: black (non-refl)
Background: orange



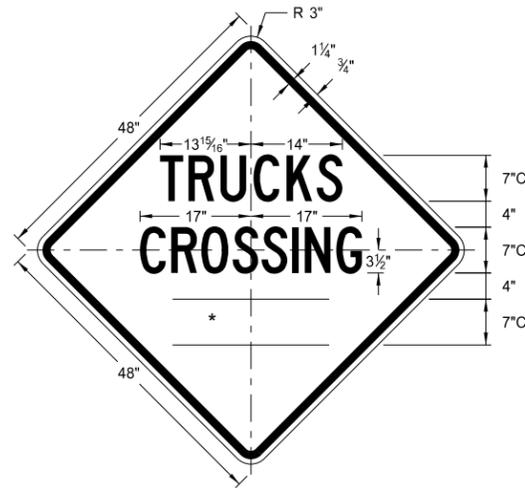
W20-51-48
Legend: black (non-refl)
Background: orange



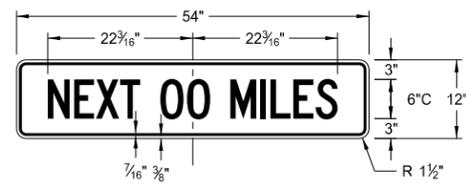
W21-51-48
Legend: black (non-refl)
Background: orange



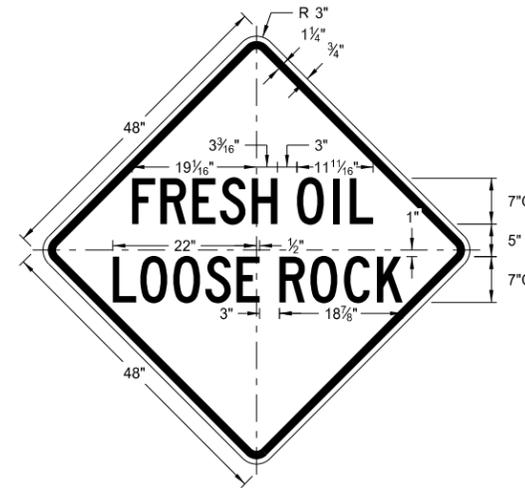
W5-9-48
Legend: black (non-refl)
Background: orange



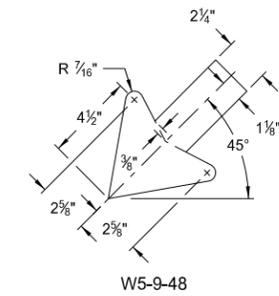
W8-55-48
Legend: black (non-refl)
Background: orange



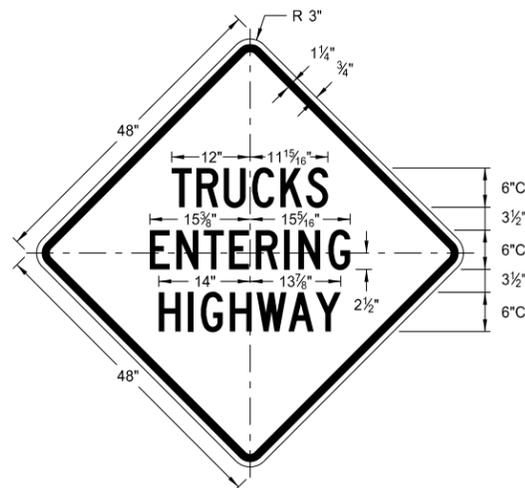
W20-52-54
Legend: black (non-refl)
Background: orange



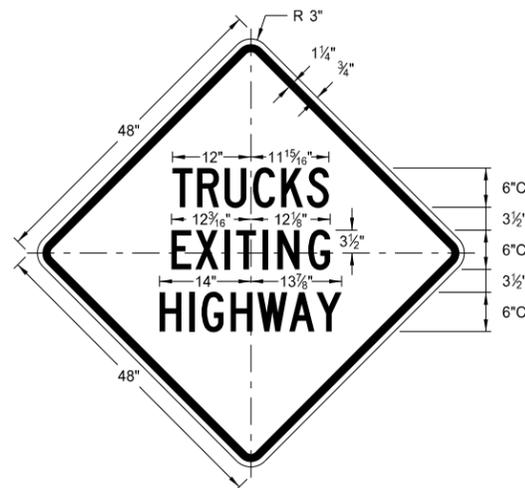
W22-8-48
Legend: black (non-refl)
Background: orange



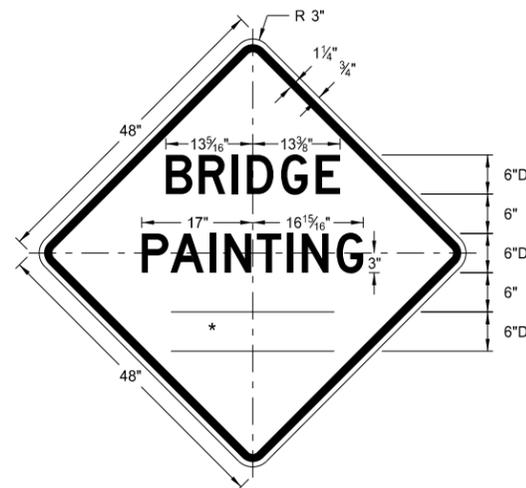
W5-9-48
ARROW DETAILS



W8-53-48
Legend: black (non-refl)
Background: orange



W8-56-48
Legend: black (non-refl)
Background: orange

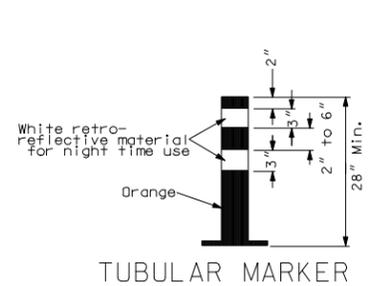


W21-50-48
Legend: black (non-refl)
Background: orange

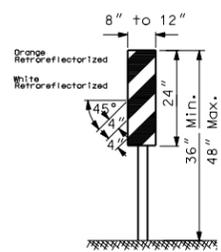
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 8/13/13 and the original document is stored at the North Dakota Department of Transportation

BARRICADE DETAILS AND CHANNELIZING DEVICES

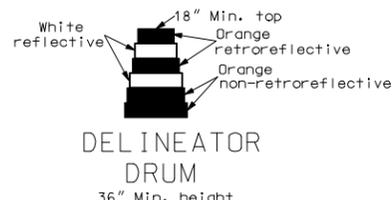


TUBULAR MARKER



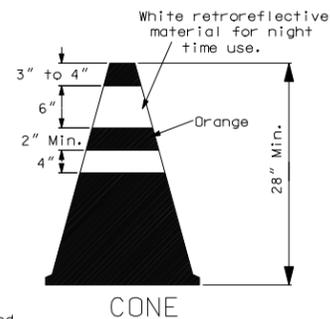
VERTICAL PANEL

(Retroreflective sheeting shall be placed on both sides)
NOTE: Vertical panels used on the expressways or other high speed roadways shall be 12" by 24"

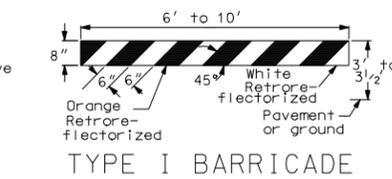


DELINEATOR DRUM
36" Min. height

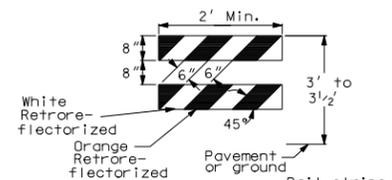
The markings on drums shall be orange and white stripes 4 to 6 inches wide. There shall be at least two orange and two white stripes. Where drums have ribs or indentations, there shall be no retroreflective sheeting in this area. This space shall be no more than 2 inches wide. The drum surface shall be prepared as recommended by the sheeting manufacturer before retro reflective sheeting is applied.



CONE

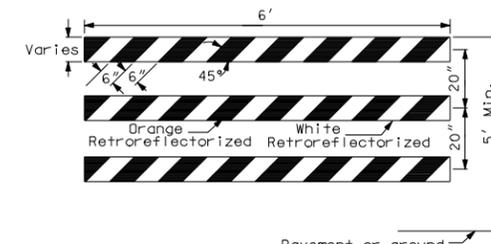


TYPE I BARRICADE



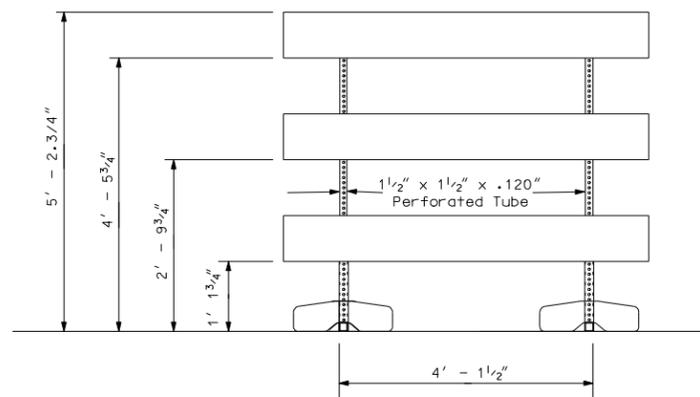
TYPE II BARRICADE

Rail stripe width shall be 4" if barricade length is less than 36".

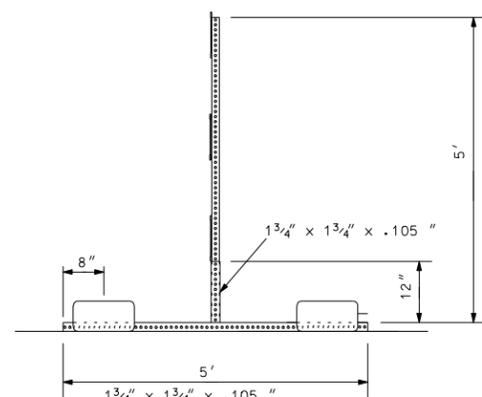


TYPE III BARRICADE

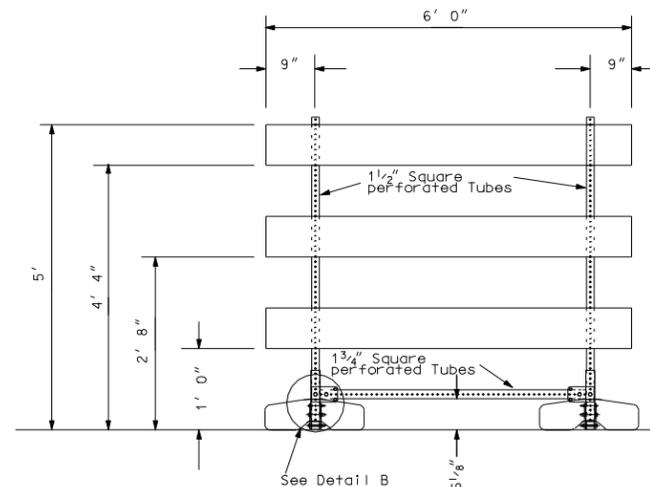
BARRICADES:
Number of retroreflective rail faces:
Type I - 2 (One each direction)
Type II - 4 (Two each direction)
Type III - 6 (Three in each direction)



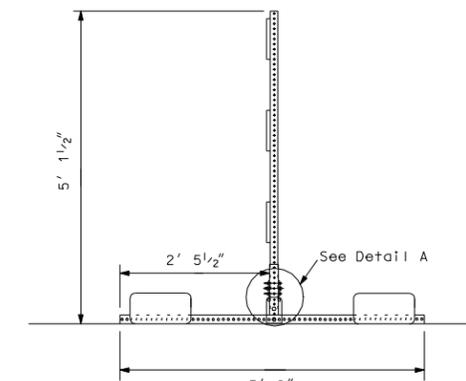
FRONT VIEW



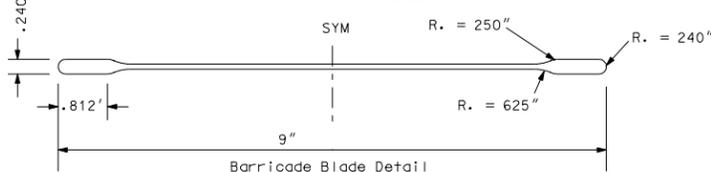
END VIEW



See Detail B



See Detail A



Barricade Blade Detail

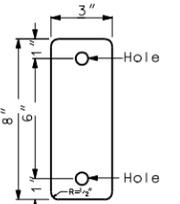
Ballast = 45lb sandbag at the end of each leg.
Barricade blade fastened to vertical supports with 2" corner bolts.
Vertical portion of leg is welded to horizontal portion on all four sides.
Masts slide inside vertical portion of legs. No bolts or fastenings devices used.

BARRICADE ASSEMBLY DETAIL
(Use when aluminum blade as detailed above)



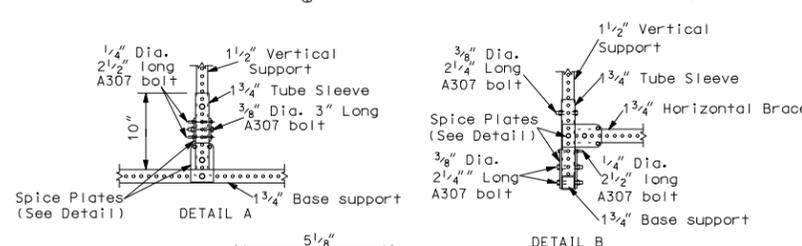
ACRYLIC PLASTIC REFLECTOR

Delineator reflector shall meet the requirements of section 894



DELINEATOR REFLECTOR

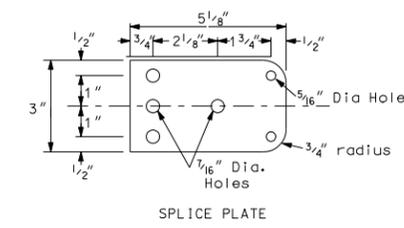
3"x8"- 18 Gauge galvanized steel sheet or 0.080" aluminum plate with white retroreflective sheeting (Type 3A or 3B) as specified in section 894 of the Standard Specifications.



Splice Plates (See Detail)

DETAIL A

DETAIL B



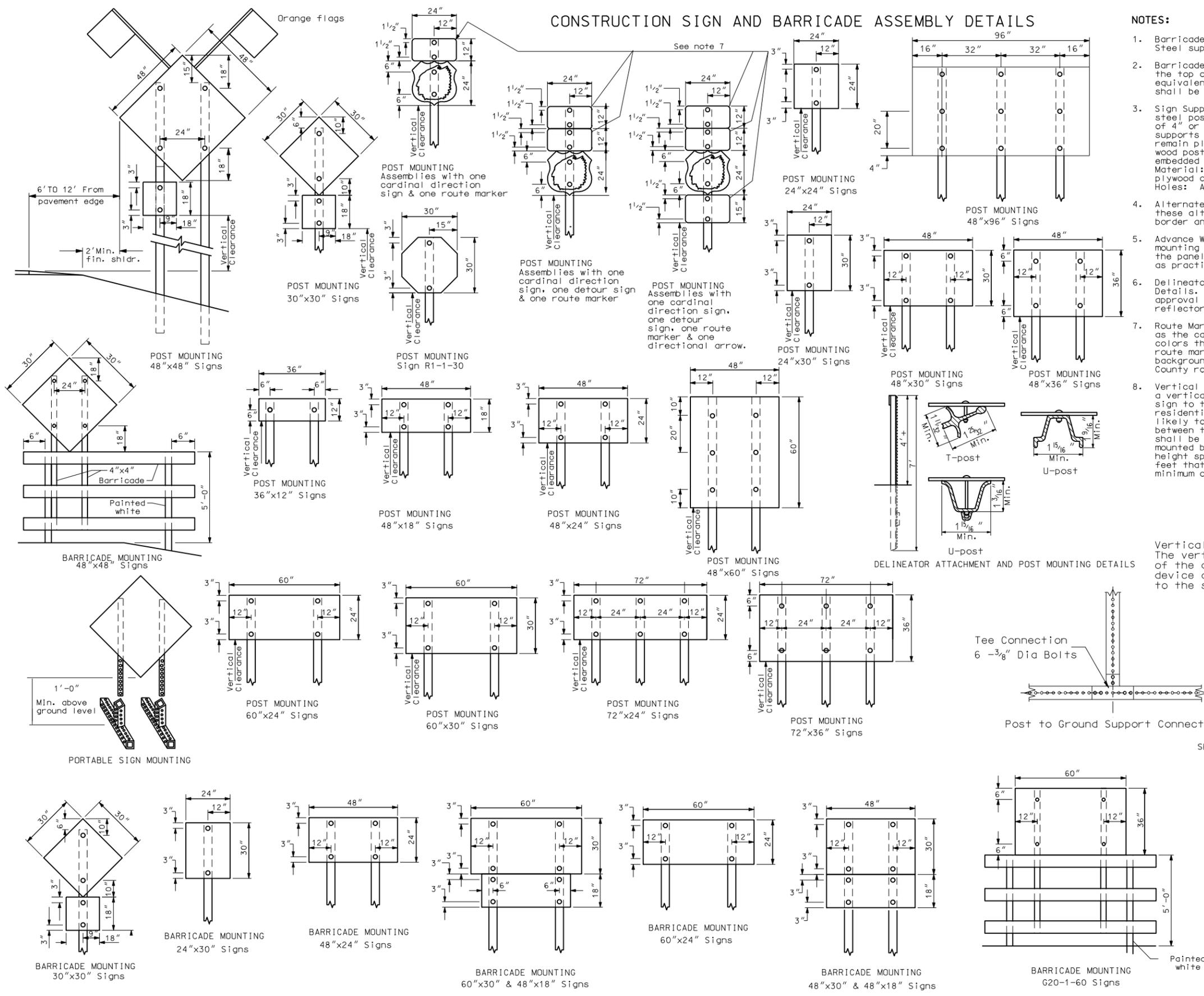
SPLICE PLATE

BARRICADE ASSEMBLY DETAIL
(Use when Plastic I-Beam w/ 1 1/2" Hollow Core Flanges or 1" x 8" x72" wood boards.)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
08-03-87	Type sheeting
10-01-87	Delineator drum note
06-08-88	Barricade type III
06-01-92	General revision
06-10-93	General revision
09-23-93	Vertical panel
06-09-95	Reflective sheeting
03-01-02	Barricade type III assembly details
04-01-02	Type III barricade
12-01-04	PE stamp added
06-29-05	Revised Type II barricade stripe

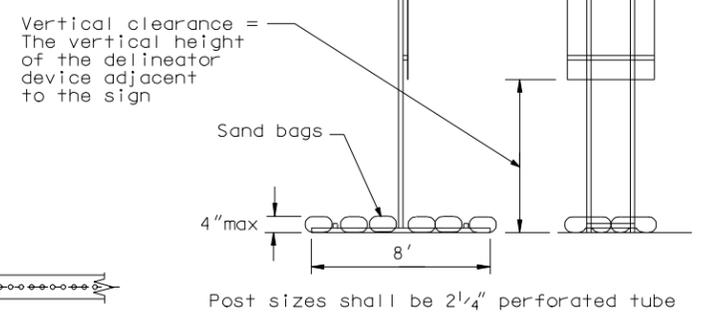
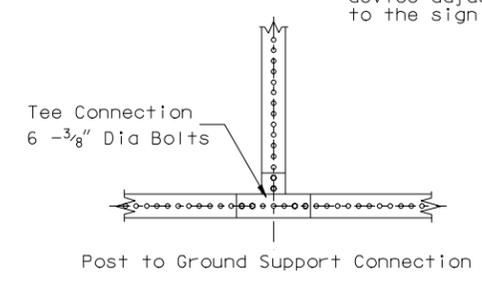
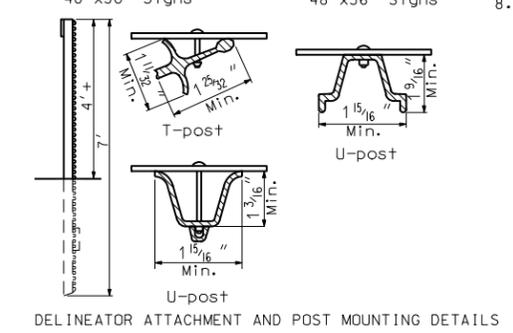
This document was originally issued and sealed by MARK S GAYDOS Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS



NOTES:

1. Barricade and Sign Supports: Wooden supports shall be painted white. Steel supports shall be galvanized or painted.
2. Barricade Mounting Signs: The bottom of the sign shall be flush with the top of the top rail. Wood sign posts shall be 4"x4" min. SFS or equivalent steel posts. All barricades and barricade mounted signs shall be assembled with 3/8" bolts.
3. Sign Supports: Sign supports shall be 4"x4" min. SFS or equivalent steel post. The anchor for steel supports shall have a stub height of 4" or less. Wood posts more than 4"x4" shall be breakaway. Sign supports shall be imbedded to a sufficient depth so that signs will remain plumb throughout duration of project. It is suggested that wood posts have a min. depth of embedment of 5' and steel posts be imbedded a min. 3'-6". Material: All signs shall be 0.100" aluminum, 12 gauge steel, 1/2" plywood or other approved material. Holes: All holes to be punched round for 3/8" bolts.
4. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate without a border and this plate installed and removed as required.
5. Advance Warning Flashing or Sequencing Arrow Panels: The minimum mounting height shall be 7 feet above the roadway to the bottom of the panel, except on vehicle mounted panels which shall be as high as practicable.
6. Delineator Posts: Typical fence post sections are shown in Attachment Details. Other types of metal fence posts may be substituted upon approval of the engineer. These substituted posts shall have reflectors attached similar to the ones shown.
7. Route Marker Auxiliary Signs: The route marker auxiliary signs such as the cardinal direction and directional arrows shall have background colors the same as the route marker they are used with (Interstate route markers, blue background, US and State route markers, white background, Interstate Business loop and spur, green background, and County route markers, blue background).
8. Vertical Clearance: Post mounted signs placed in rural areas shall have a vertical clearance of at least 5 feet measured from the bottom of the sign to the near edge of the driving lane. In business, commercial and residential districts where parking and/or pedestrian movement is likely to occur or where other obstructions to view, the distance between the bottom of the sign to the near edge of the driving lane shall be at least 7 feet. The height to the bottom of secondary signs mounted below another sign may be 1 foot less than the appropriate height specified. Large signs having an area exceeding 50 square feet that are installed on multiple breakaway posts shall be mounted a minimum of 7 feet above the ground.

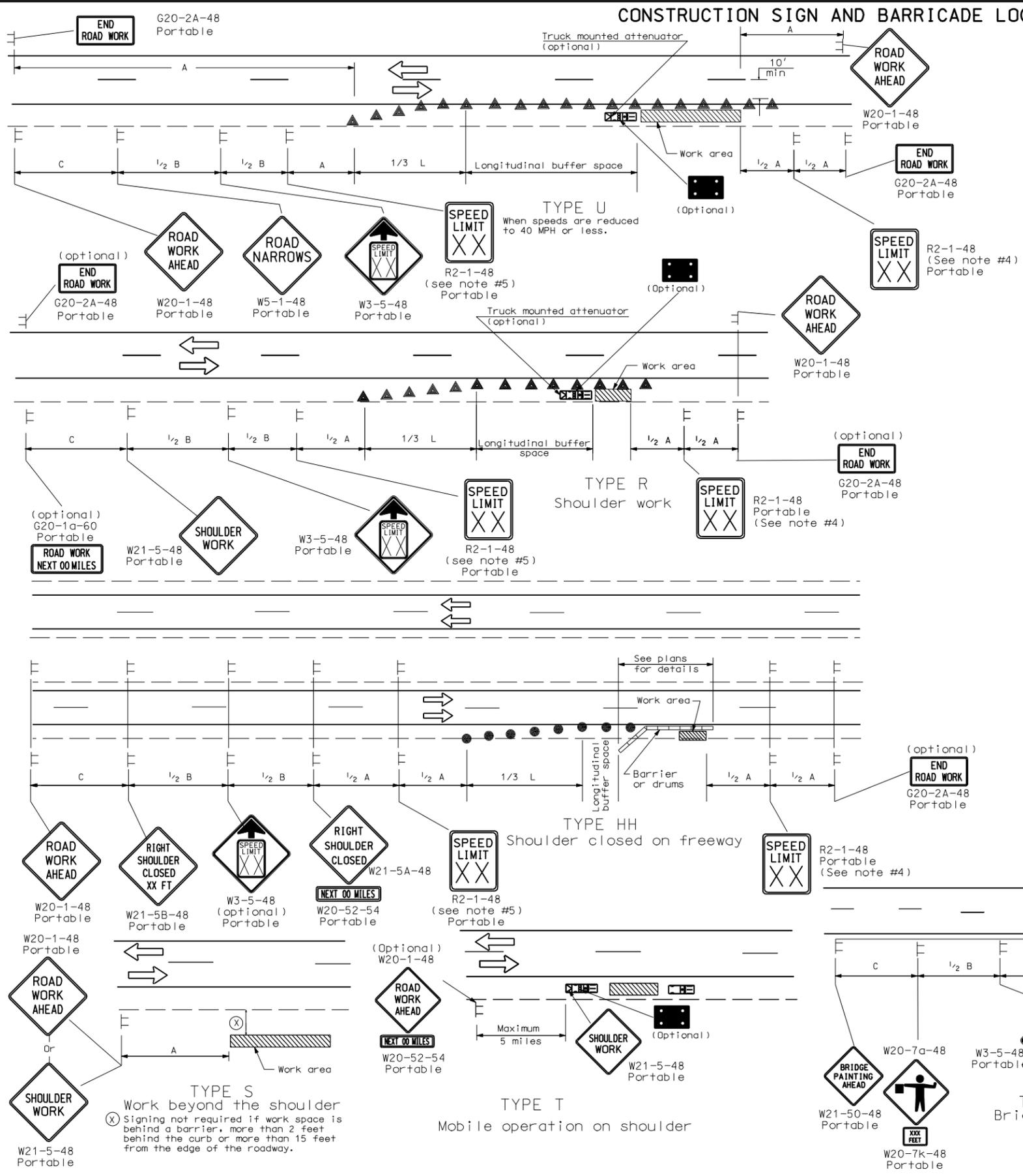


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
08-01-88	Sign assembly
05-01-92	Sign assembly
03-30-93	Sign supports note
03-04-96	Sign height
08-15-96	Note 8
07-10-97	Note revision
01-31-98	Note & portable sign
10-01-99	Skid mounted sign
02-07-03	Vertical clearance note
11-30-04	Third post added to some signs
12-01-04	PE stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

- Notes
- Variables
 S = Numerical value of speed limit or 85th percentile.
 W = The width of the taper.
 L = Minimum length of taper, or $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Delineator drums, or cones used for tapering traffic shall be spaced at dimension "S". Delineator drums, or cones used for tangents shall be spaced at 2 times "S".
 - Sequencing Arrow Panels
 Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).
 Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph and 5000 ADT or less).
 Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph and 5000 ADT).
 The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at $1/2 B$.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.



Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

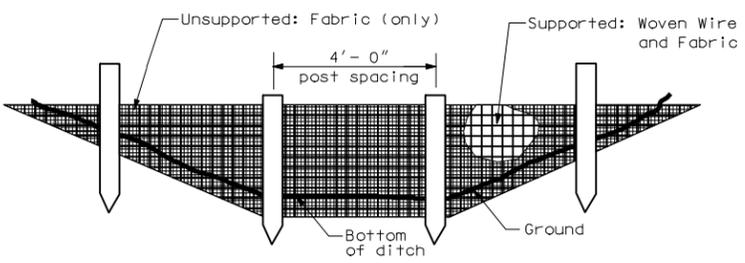
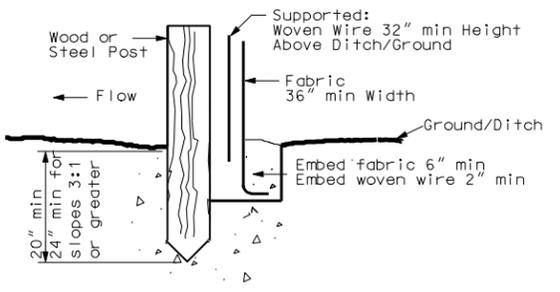
KEY

- Type I barricade
- Type II barricade
- Type III barricade
- Sign
- Delineator drum
- Cones
- Work area
- Flagger
- Sequencing arrow panel
- Type A delineator or vertical panels back to back

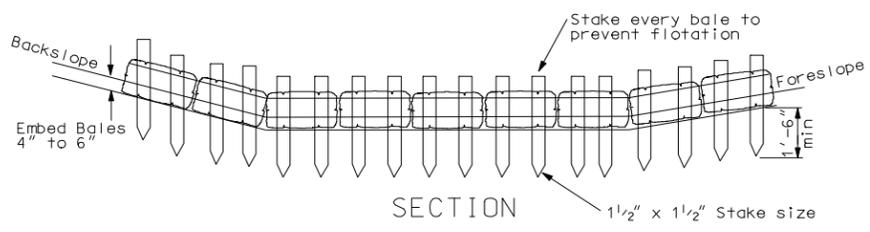
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
DATE	REVISIONS
10-01-99	General revisions
10-04-99	Type HH barrier
11-15-99	Add taper width & note
03-15-01	Revised note 2
07-19-02	Reversed End Road Work & Speed Limit signs
07-25-03	Revised R2-1a and W20-1
04-01-04	Removed fee sign & rev warning & buffer spacing rev note 5
12-01-04	PE Stamp added
06-29-05	Replaced R2-5a with W3-5 Rev. Adv. Warning Table, Rev. Note 5

This document was originally issued and sealed by Mark S Gaydos Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation

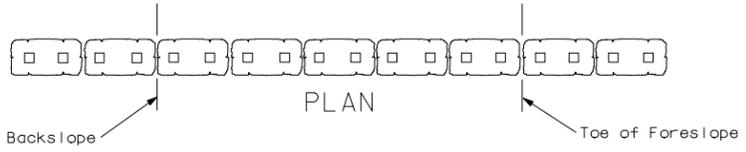
EROSION AND SILTATION CONTROLS



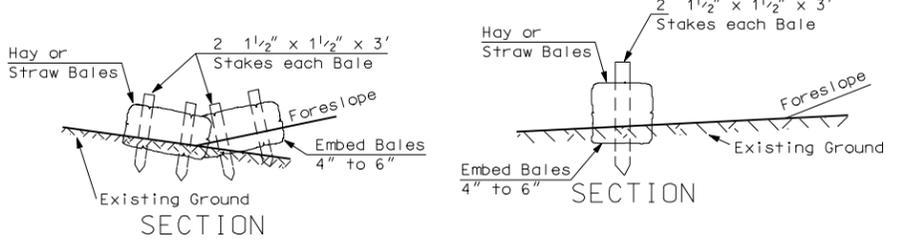
SILT FENCE
Supported and Unsupported



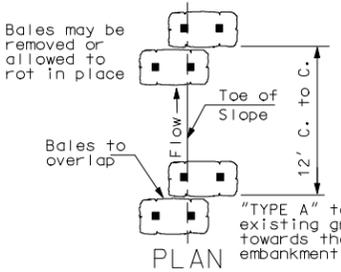
SECTION



"TYPE A"

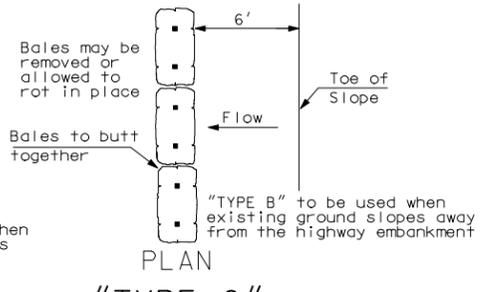


SECTION



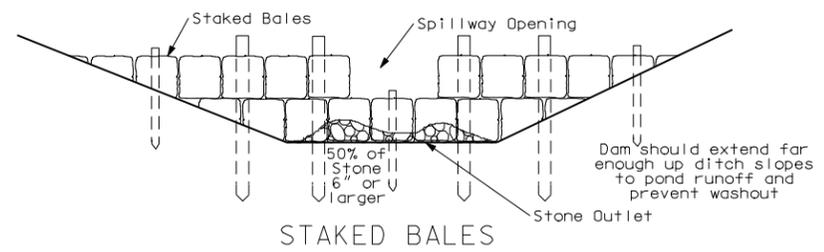
PLAN

"TYPE B"
BALED HAY OR STRAW EROSION CHECKS

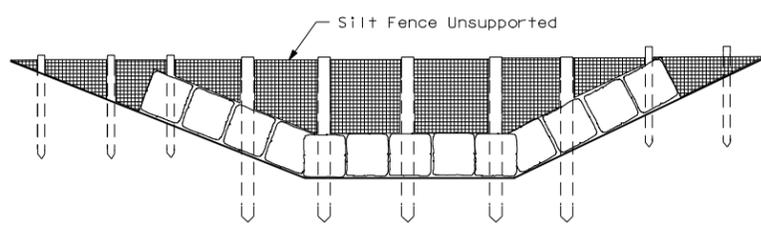


PLAN

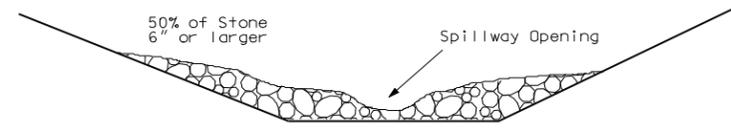
"TYPE C"



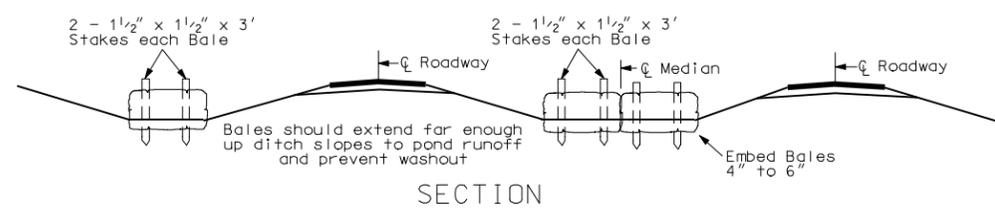
STAKED BALES



FENCE-BACKED BALES

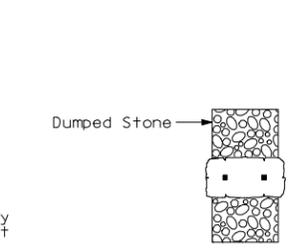
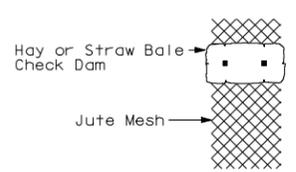


DITCH EROSION DAMS

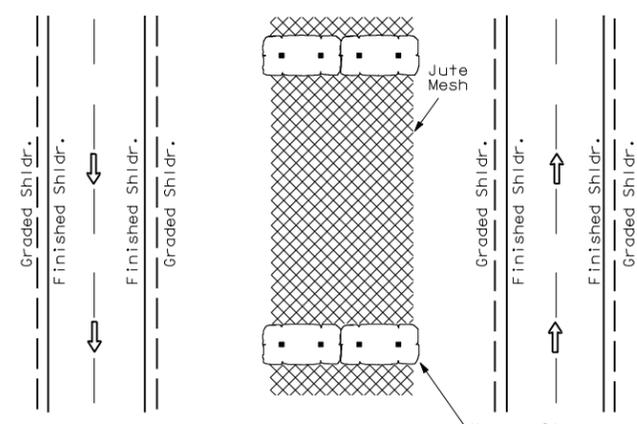


SECTION

MEDIAN OR DITCH PROTECTION AT STREAM CROSSING

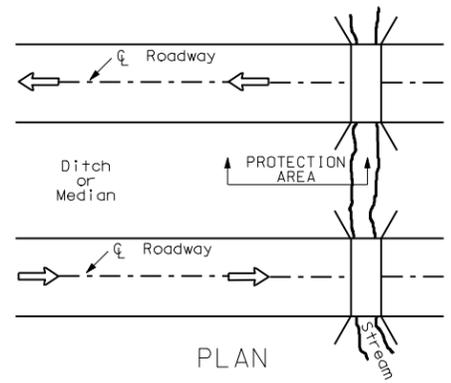


ROADSIDE DITCH

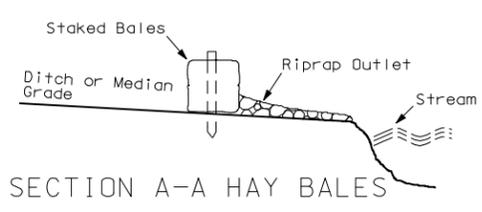


PLAN

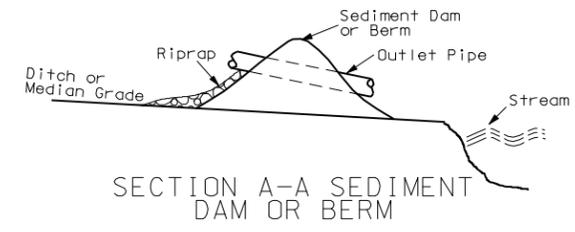
STONE, JUTE, MESH, OR SOD
DITCH & MEDIAN EROSION CONTROL



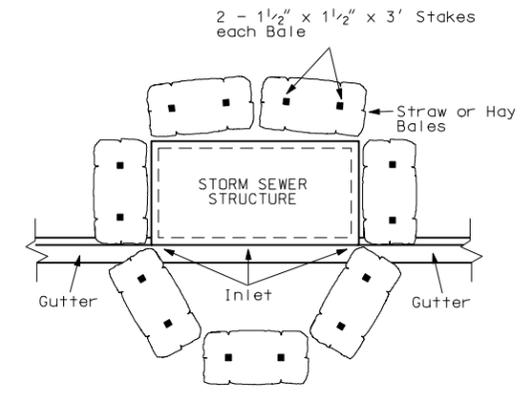
PLAN



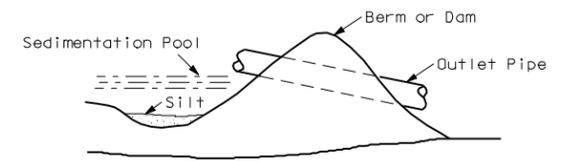
SECTION A-A HAY BALES



SECTION A-A SEDIMENT DAM OR BERM



STORM SEWER INLET
EROSION & SILTATION
BARRIER



SMALL SEDIMENT DAM OR BERM

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
09-04-92	Ditch check
09-16-92	Sediment cont. fencing
01-31-95	General revisions
10-09-02	Sediment fence
01-24-04	Silt fence
02-06-04	Rev silt fence details
12-01-04	PE Stamp added

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 12/01/04 and the original document is stored at the North Dakota Department of Transportation