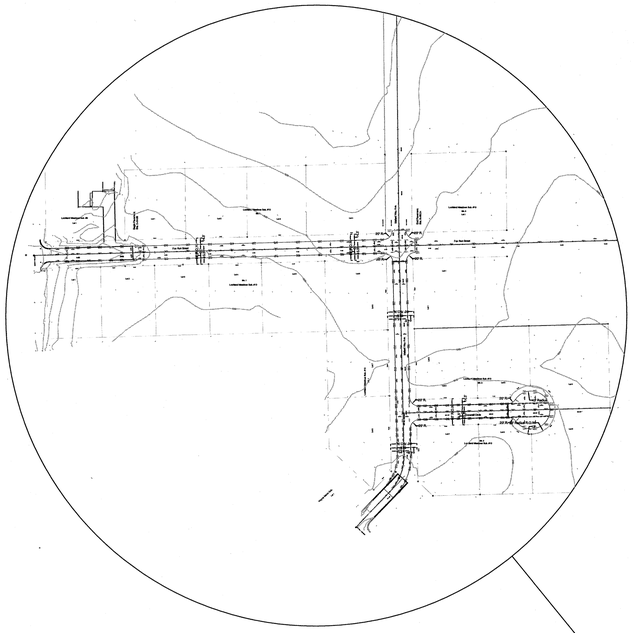
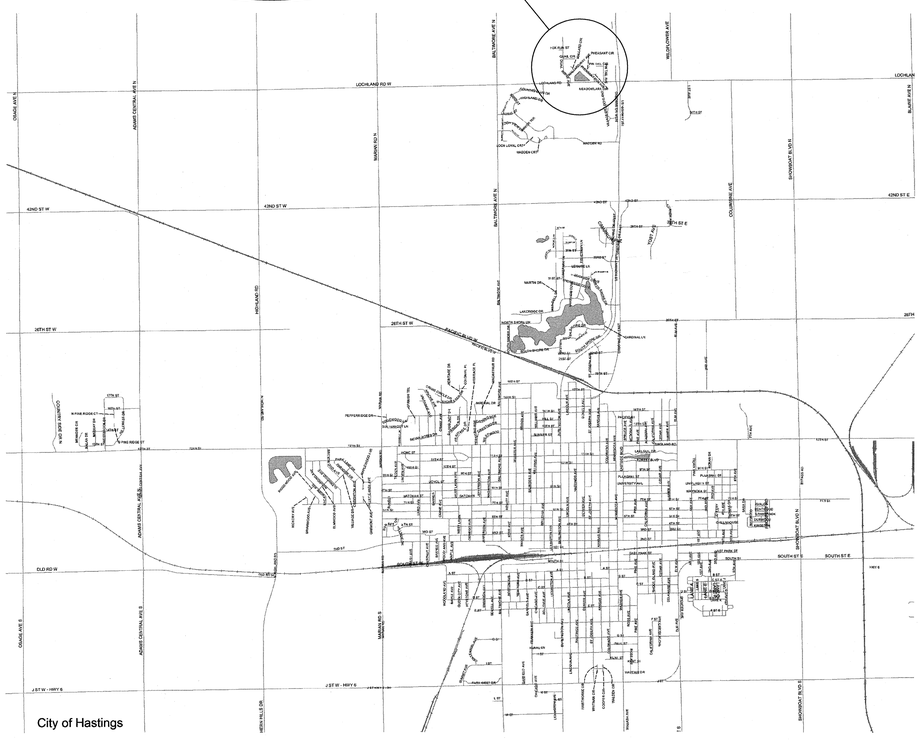
SID 2016-2

Fox Run Street, Mallard Way Avenue, and Dovetail Circle



North
Scale: None



City of Hastings

INDEX OF SHEETS

SHEET NO. 1	TITLE SHEET
SHEET NO. 2	GRADING PLAN
SHEET NO. 3	JOINT DETAIL
SHEET NO. 4-5	FOX RUN PLAN AND PROFILE SHEETS
SHEET NO. 6-9	FOX RUN CROSS SECTION SHEETS
SHEET NO. 10	MALLARD WAY PLAN AND PROFILE SHEET
SHEET NO. 11-12	MALLARD WAY CROSS SECTION SHEETS
SHEET NO. 13	DOVETAIL CIRCLE PLAN AND PROFILE SHEET
SHEET NO. 14-16	DOVETAIL CIRCLE CROSS SECTION SHEETS

LEGEND

- Spot Elevation
- Utility Pole
- Control Point - Nail Set
- Control Point - Temporary Wood Hub Set
- Deciduous Tree
- Coniferous Tree
- Manhole
- Fire Hydrant
- Water Valve
- Gas Valve
- Light
- Telephone Box
- Electrical Junction Box
- 1912 Contour Line
- Flowline
- Property Line

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DIGGERS HOTLINE OF NEBRASKA
1-800-331-5666

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITIES	UNIT
1	Mobilization	1.0	L.S.
2	Remove Header	31.0	L.F.
3	Remove Pavement	161.0	S.Y.
4	Earthwork (E.Q.)	1.0	Lump Sum
5	Build 6" P.C.C. Pavement 47B-3500	5706.0	S.Y.
6	Build Concrete Header 47B-3500	62.0	L.F.
7	Adjust Manhole to Grade	6.0	Each
8	Adjust Valve Box to Grade	1.0	Each
9	Silt Fence, Low Porosity	450.0	L.F.
10	Build Compacted Earth Berm for Erosion Control	1577.0	L.F.
11	Furnish and install 30' x 31' C-125 Turf Reinforcement Mat	930.0	S.F.
12	Erosion Checks, 12" Straw Wattle	360.0	L.F.
13	Barricades, Signage, Traffic Control & Maintenance therof	1.0	Lump Sum

NOTES:

The embankment and subgrade shall be adjusted to conform to the lines and grades on the plans in accordance with Section 205 and 302 of the 2007 Standard State Specifications and its supplements. The upper six (6) inches of the subgrade shall be scarified, mixed and recompacted to the following compaction requirements:

Percent Density	Moisture Minimum	Requirements Maximum
95 Min.	Opt. -3%	Opt. +3%

Areas not meeting specified moisture density test requirements shall be removed and recompacted at the Contractor's expense.

All subgrade compaction and water necessary for subgrade construction shall not be paid for directly but shall be considered subsidiary to the items of the contract.

Excavation, backfilling, and sawing control joints, keyway, tie bars, dowel pins, and rubberized joint sealant shall be considered subsidiary to the unit price per square yard of pavement.

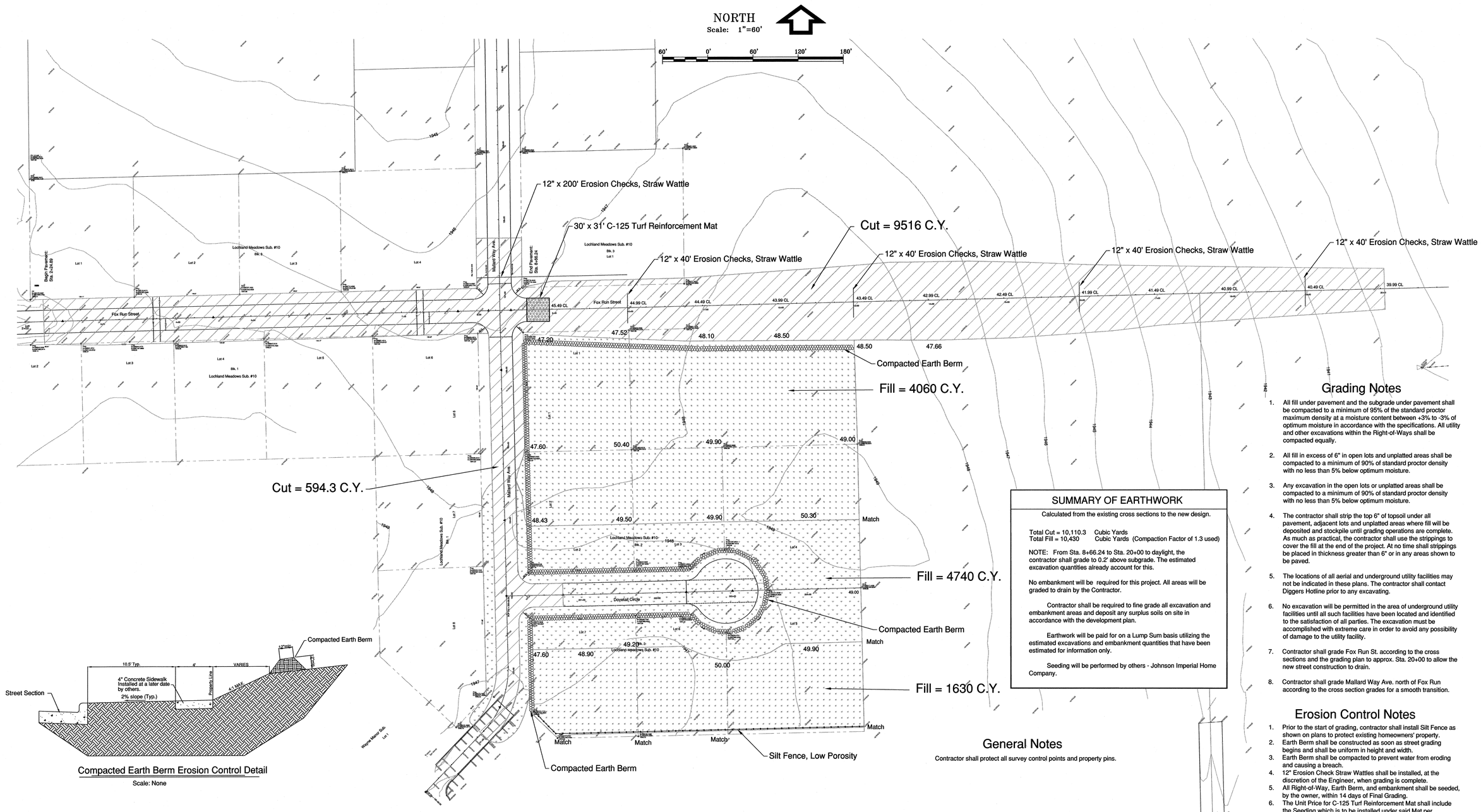
REGISTERED PROFESSIONAL ENGINEER
DAVID L. WACKER
E-5030
3-30-2016
STATE OF NEBRASKA

Keith Sanderson — 3-31-2016
Utilities Director of Engineering — Date

Robert K. Ramsey — 3/31/2016
Hastings City Surveyor — Date

David L. Wacker — 3-30-2016
Hastings City Engineer — Date

CITY OF HASTINGS, ENGINEERING DEPT.	
Project	FOX RUN ST, MALLARD WAY AVE, & DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	TITLE SHEET
Design By B.B.	Date 3/2016 / Contractor
Drawn By B.B.	Approved By / Drn. No. 1 of 16



Compacted Earth Berm Erosion Control Detail

Scale: None

Grading Notes

1. All fill under pavement and the subgrade under pavement shall be compacted to a minimum of 95% of the standard proctor maximum density at a moisture content between +3% to -3% of optimum moisture in accordance with the specifications. All utility and other excavations within the Right-of-Ways shall be compacted equally.
2. All fill in excess of 6" in open lots and unplatted areas shall be compacted to a minimum of 90% of standard proctor density with no less than 5% below optimum moisture.
3. Any excavation in the open lots or unplatted areas shall be compacted to a minimum of 90% of standard proctor density with no less than 5% below optimum moisture.
4. The contractor shall strip the top 6" of topsoil under all pavement, adjacent lots and unplatted areas where fill will be deposited and stockpile until grading operations are complete. As much as practical, the contractor shall use the strippings to cover the fill at the end of the project. At no time shall strippings be placed in thickness greater than 6" or in any areas shown to be paved.
5. The locations of all aerial and underground utility facilities may not be indicated in these plans. The contractor shall contact Diggers Hotline prior to any excavating.
6. No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utility facility.
7. Contractor shall grade Fox Run St. according to the cross sections and the grading plan to approx. Sta. 20+00 to allow the new street construction to drain.
8. Contractor shall grade Mallard Way Ave. north of Fox Run according to the cross section grades for a smooth transition.

SUMMARY OF EARTHWORK

Calculated from the existing cross sections to the new design.

Total Cut = 10,110.3 Cubic Yards
Total Fill = 10,430 Cubic Yards (Compaction Factor of 1.3 used)

NOTE: From Sta. 8+66.24 to Sta. 20+00 to daylight, the contractor shall grade to 0.2' above subgrade. The estimated excavation quantities already account for this.

No embankment will be required for this project. All areas will be graded to drain by the Contractor.

Contractor shall be required to fine grade all excavation and embankment areas and deposit any surplus soils on site in accordance with the development plan.

Earthwork will be paid for on a Lump Sum basis utilizing the estimated excavations and embankment quantities that have been estimated for information only.

Seeding will be performed by others - Johnson Imperial Home Company.

Erosion Control Notes

1. Prior to the start of grading, contractor shall install Silt Fence as shown on plans to protect existing homeowners' property.
2. Earth Berm shall be constructed as soon as street grading begins and shall be uniform in height and width.
3. Earth Berm shall be compacted to prevent water from eroding and causing a breach.
4. 12" Erosion Check Straw Wattles shall be installed, at the discretion of the Engineer, when grading is complete.
5. All Right-of-Way, Earth Berm, and embankment shall be seeded, by the owner, within 14 days of Final Grading.
6. The Unit Price for C-125 Turf Reinforcement Mat shall include the Seeding which is to be installed under said Mat per Manufacturers' instructions.

General Notes

Contractor shall protect all survey control points and property pins.

Build Compacted Earth Berm for Erosion Control

Station to Station	Side	Lin. Ft.
101+50 to 106+40	RT	1577

INSTALL LOW POROSITY SILT FENCE

Station to Station	Side	Lin. Ft.
101+50	RT	450

Furnish & Install 30'x31' C-125 Turf Reinf. Mat

Station to Station	Side	Sq. Ft.
8+66.24 to 8+96.24	LT & RT	930.0

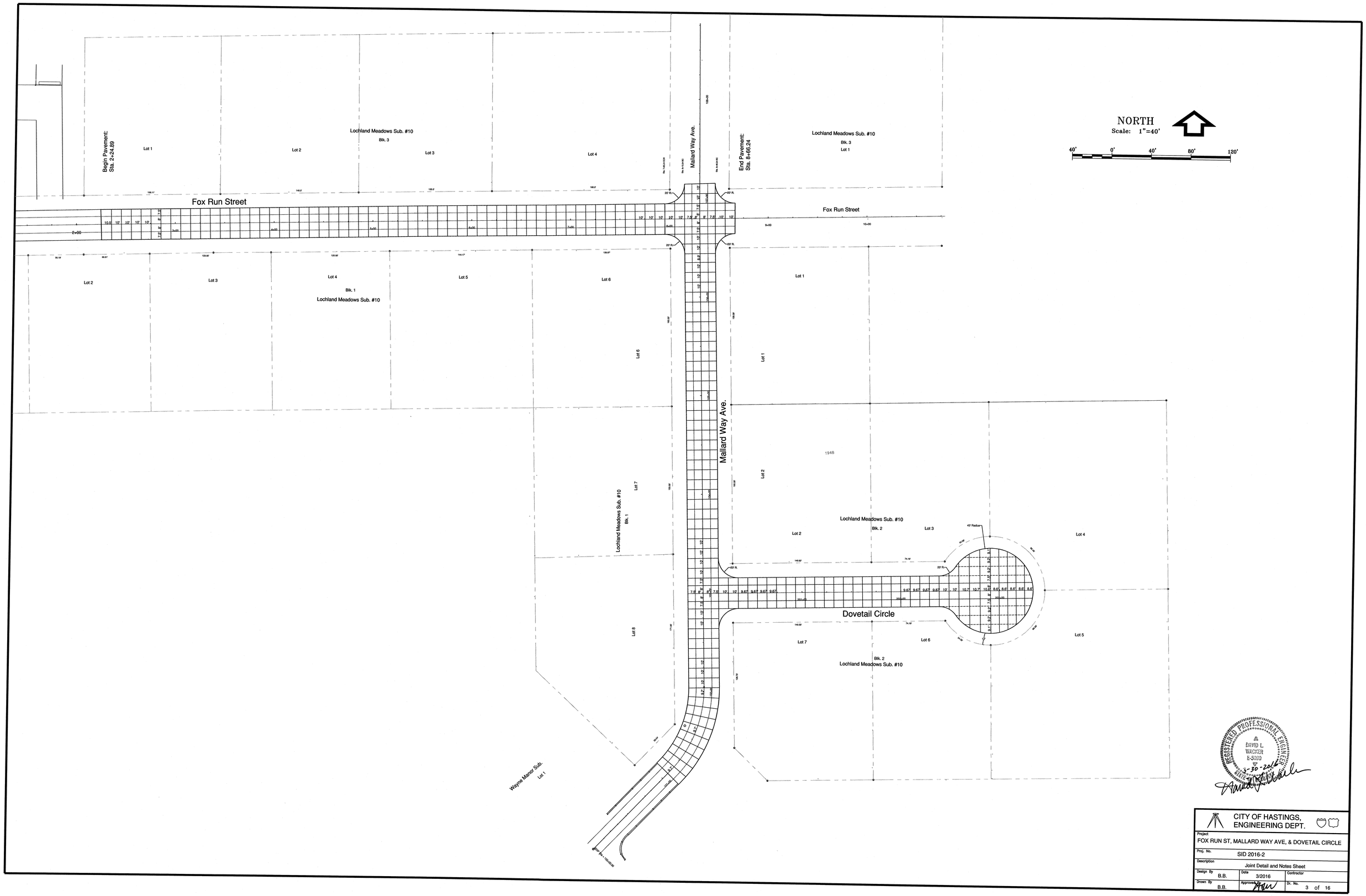
Erosion Checks, 12" Straw Wattle

Station to Station	Side	Lin. Ft.
8+00.74 to 10+00.74	LT	200
10+00	LT & RT	40
13+00	LT & RT	40
16+00	LT & RT	40
19+00	LT & RT	40

REGISTERED PROFESSIONAL ENGINEER DAVID L. WACKER E-5080 STATE OF NEBRASKA
3-30-2016

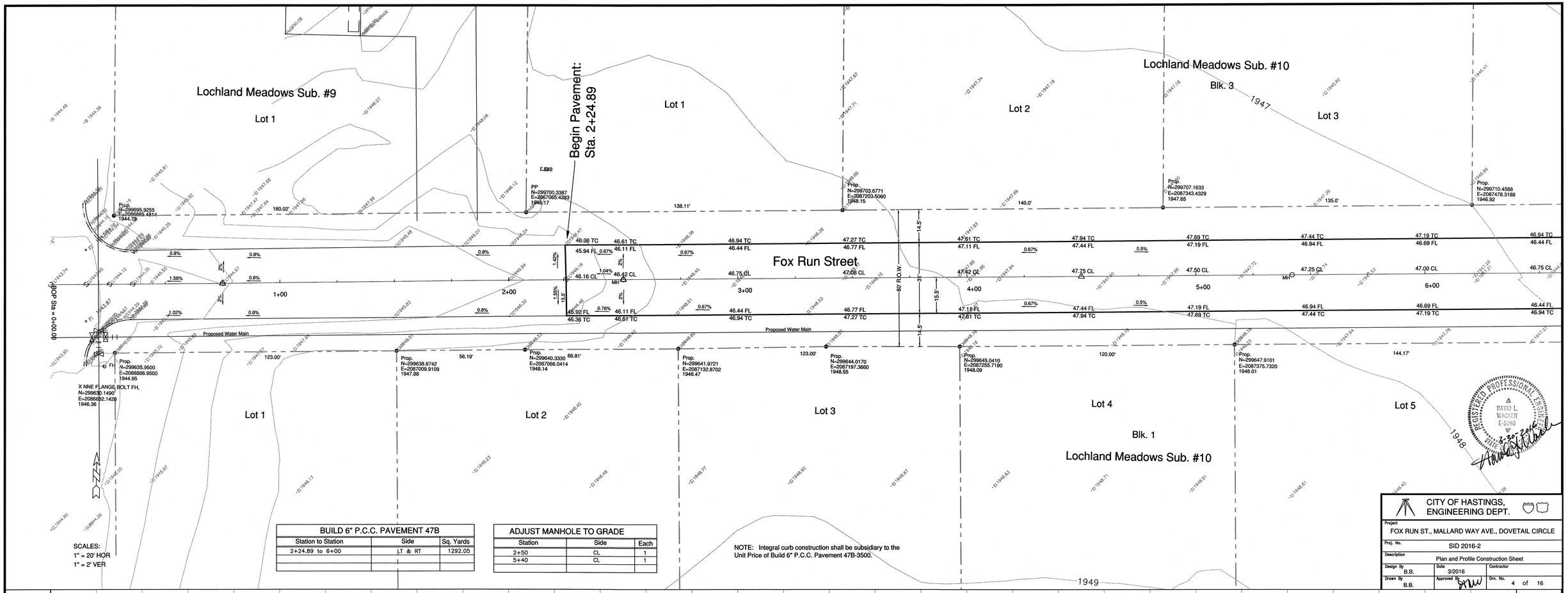
CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE		
Proj. No.	SID 2016-2		
Description	Plan and Profile Construction Sheet		
Design By B.B.	Date 3/2016	Contractor	
Drawn By B.B.	Approved By	Drn. No. 2 of 16	



REGISTERED PROFESSIONAL ENGINEER
DAVID L. WACKER
E-5020
STATE OF NEBRASKA
3-30-2016

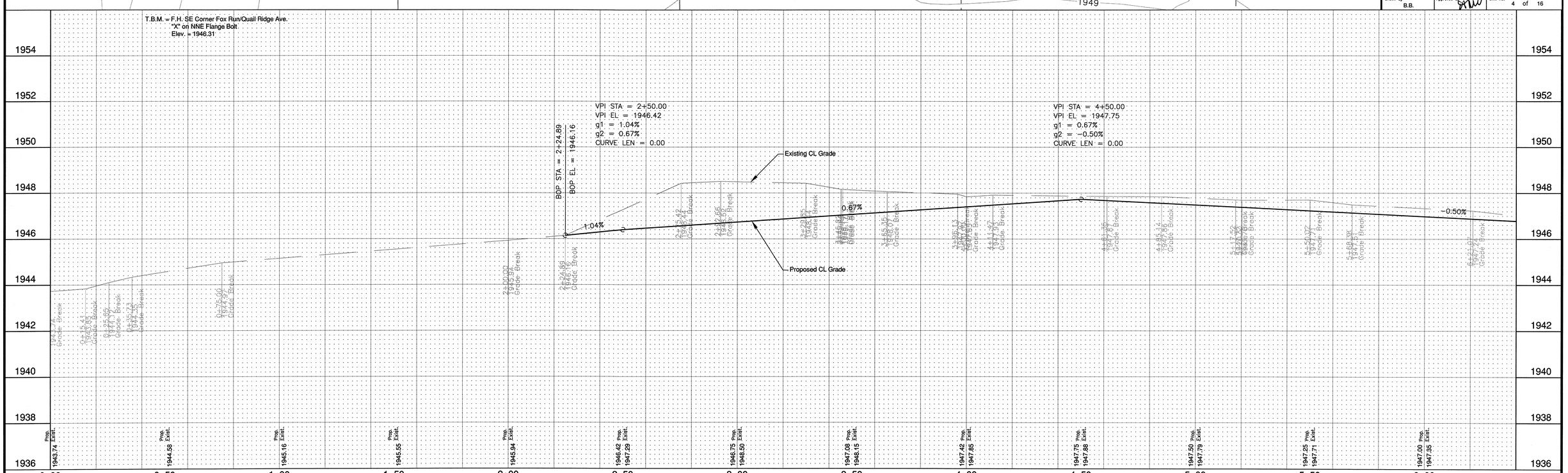
CITY OF HASTINGS, ENGINEERING DEPT.			
Project	FOX RUN ST, MALLARD WAY AVE, & DOVETAIL CIRCLE		
Proj. No.	SID 2016-2		
Description	Joint Detail and Notes Sheet		
Design By B.B.	Date 3/2016	Contractor	
Drawn By B.B.	Approved	Dr. No. 3 of 16	



BUILD 6" P.C.C. PAVEMENT 47B		
Station to Station	Side	Sq. Yards
2+24.89 to 6+00	LT & RT	1292.05

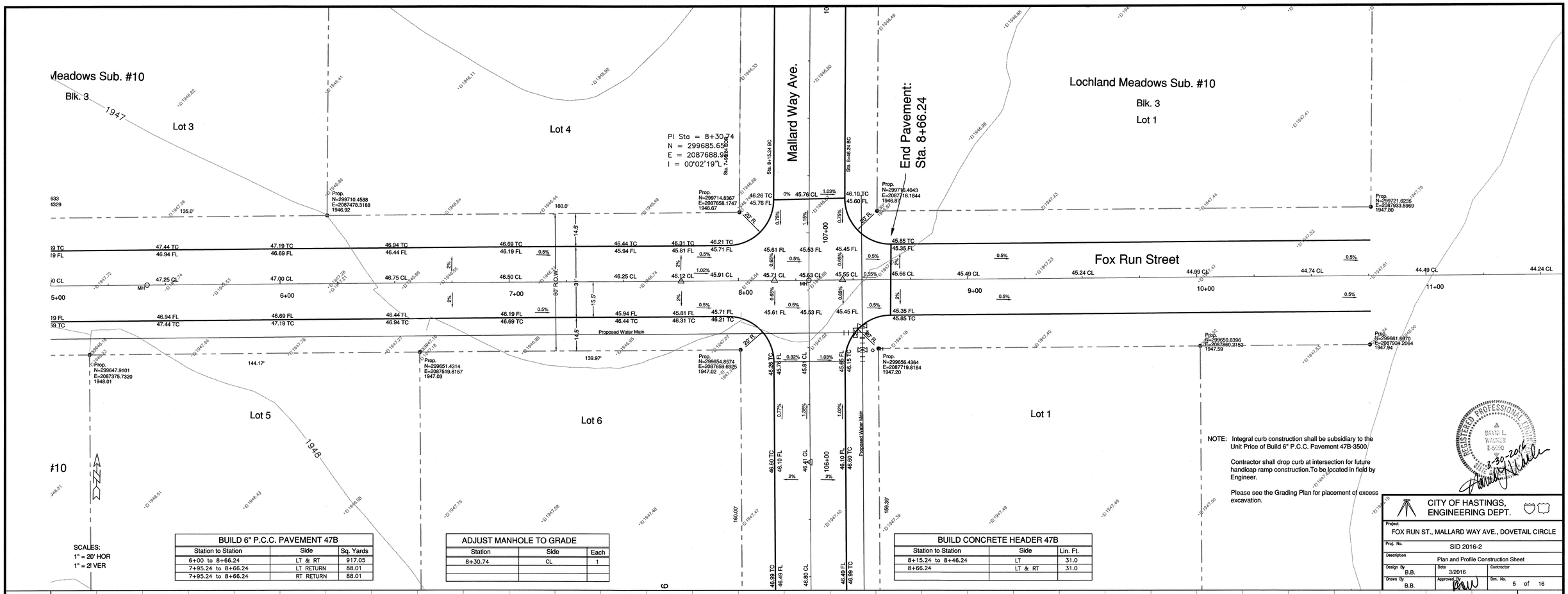
ADJUST MANHOLE TO GRADE		
Station	Side	Each
2+50	CL	1
5+40	CL	1

T.B.M. = F.H. SE Corner Fox Run/Quail Ridge Ave.
"X" on NNE Flange Bolt
Elev. = 1946.31



CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Plan and Profile Construction Sheet
Design By B.B.	Date 3/2016
Contractor	
Drawn By B.B.	Approved By
Drn. No.	4 of 16



NOTE: Integral curb construction shall be subsidiary to the Unit Price of Build 6" P.C.C. Pavement 47B-3500.

Contractor shall drop curb at intersection for future handicap ramp construction.To be located in field by Engineer.

Please see the Grading Plan for placement of excess excavation.

REGISTERED PROFESSIONAL ENGINEER DAVID L. WACKER E-5690 STATE OF NEBRASKA 3-30-2016

BUILD 6" P.C.C. PAVEMENT 47B		
Station to Station	Side	Sq. Yards
6+00 to 8+66.24	LT & RT	917.05
7+95.24 to 8+66.24	LT RETURN	88.01
7+95.24 to 8+66.24	RT RETURN	88.01

ADJUST MANHOLE TO GRADE		
Station	Side	Each
8+30.74	CL	1

BUILD CONCRETE HEADER 47B		
Station to Station	Side	Lin. Ft.
8+15.24 to 8+46.24	LT	31.0
8+66.24	LT & RT	31.0

CITY OF HASTINGS, ENGINEERING DEPT.

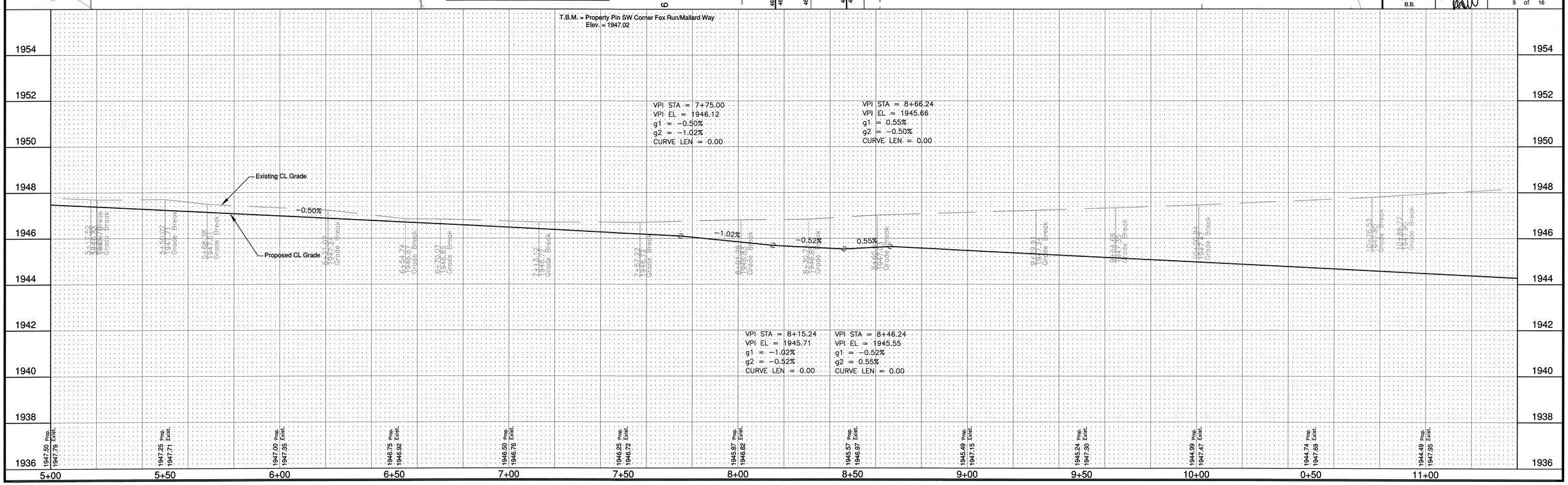
Project: FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE

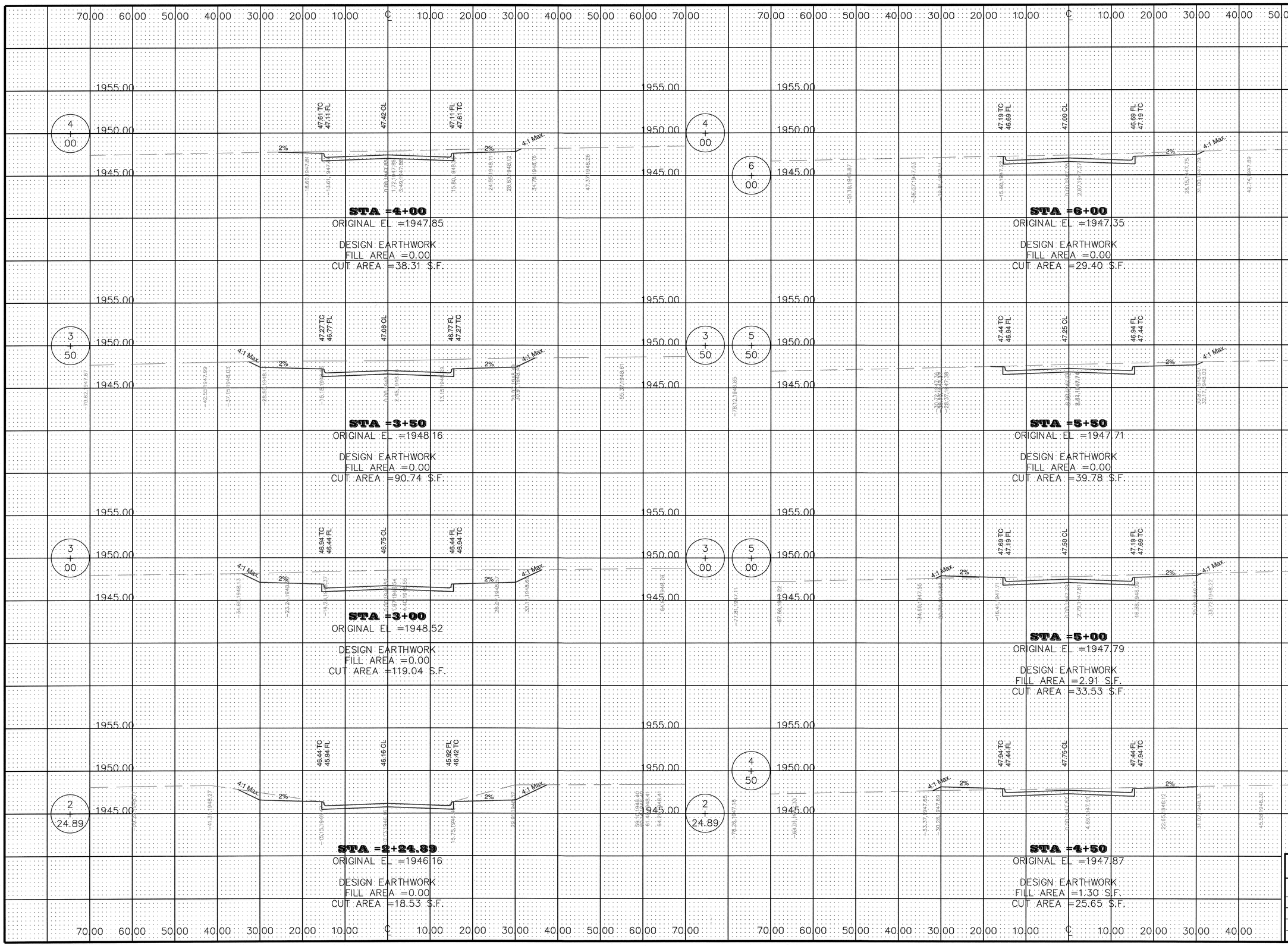
Proj. No.: SID 2016-2

Description: Plan and Profile Construction Sheet

Design By: B.B. | Date: 3/2016 | Contractor:

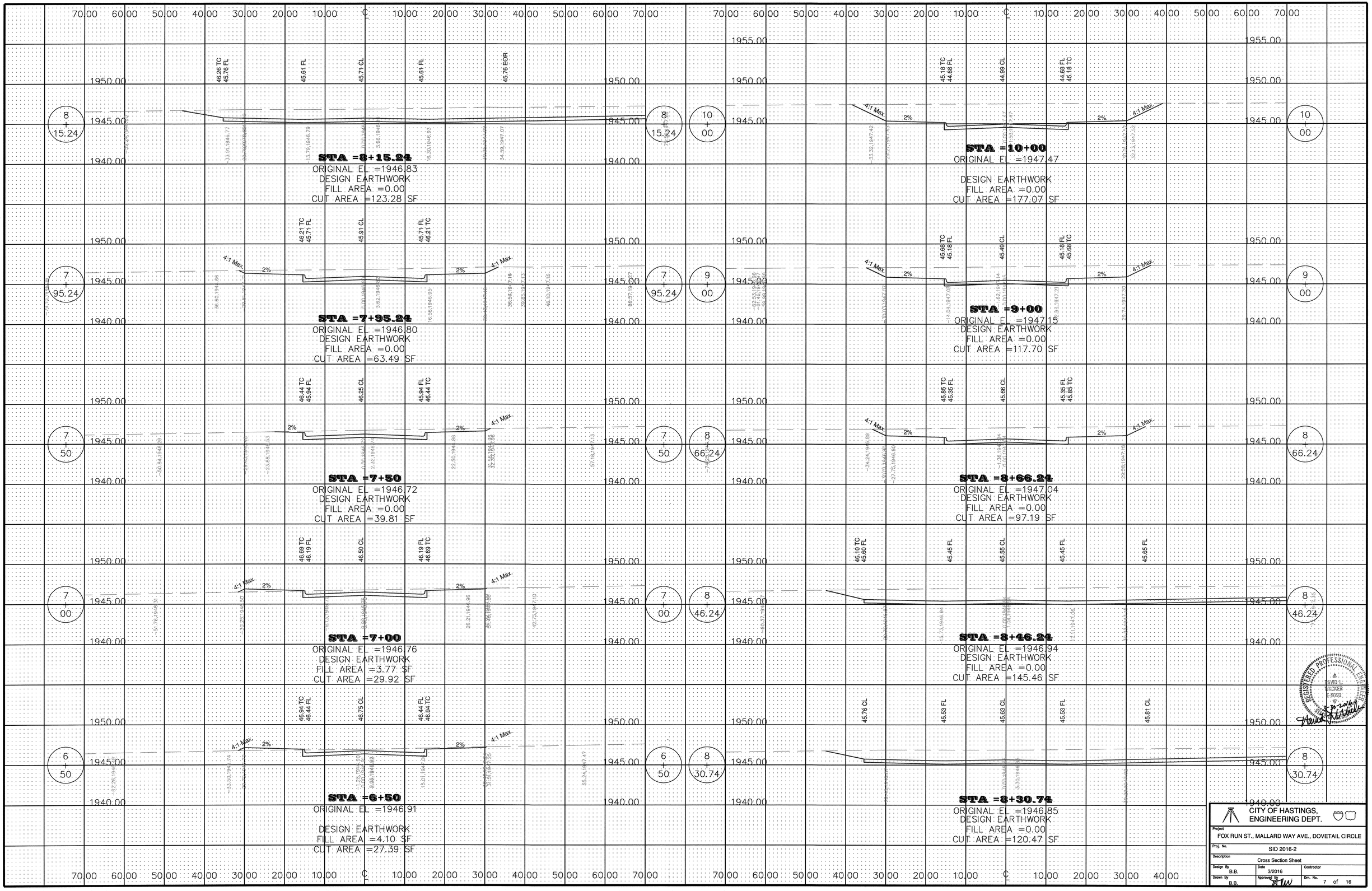
Drawn By: B.B. | Approved By: DLW | Drn. No. 5 of 16





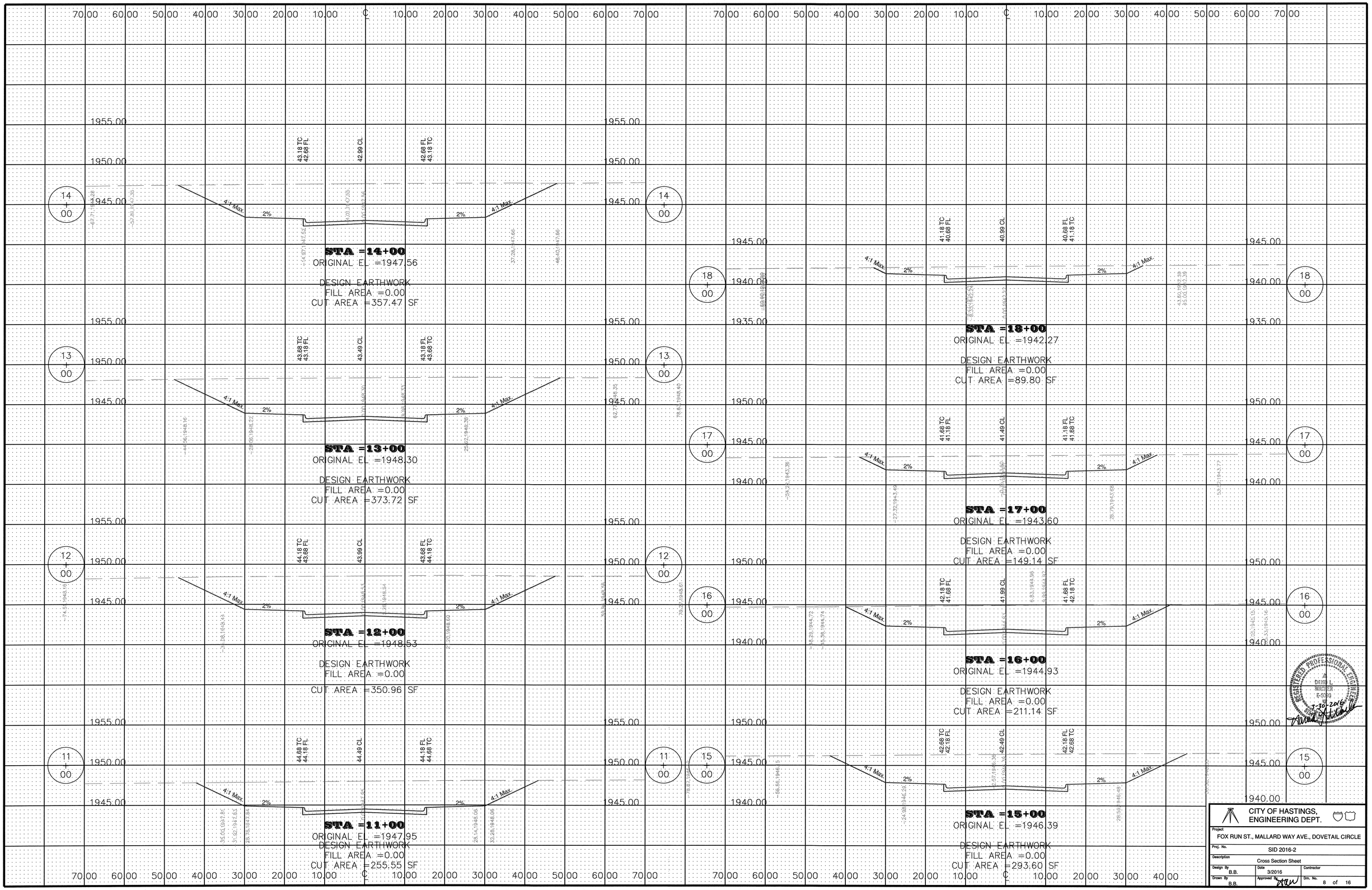
CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By	B.B.
Date	3/2016
Contractor	
Drawn By	B.B.
Approved By	
Dm. No.	6 of 16



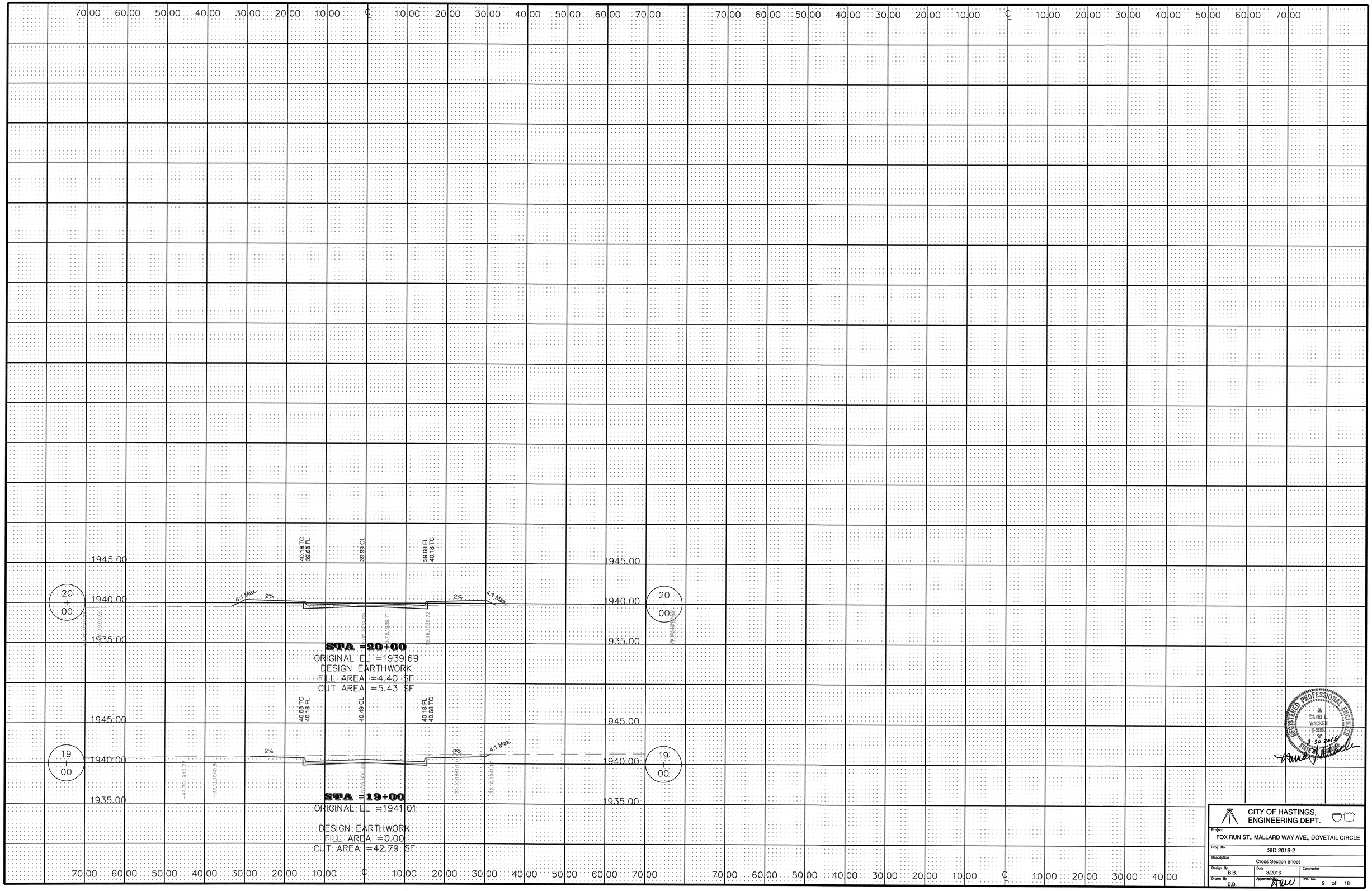
CITY OF HASTINGS, ENGINEERING DEPT.

Project: FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE		
Proj. No.: SID 2016-2		
Description: Cross Section Sheet		
Design By: B.B.	Date: 3/2016	Contractor
Drawn By: B.B.	Approved By:	Dm. No. 7 of 16



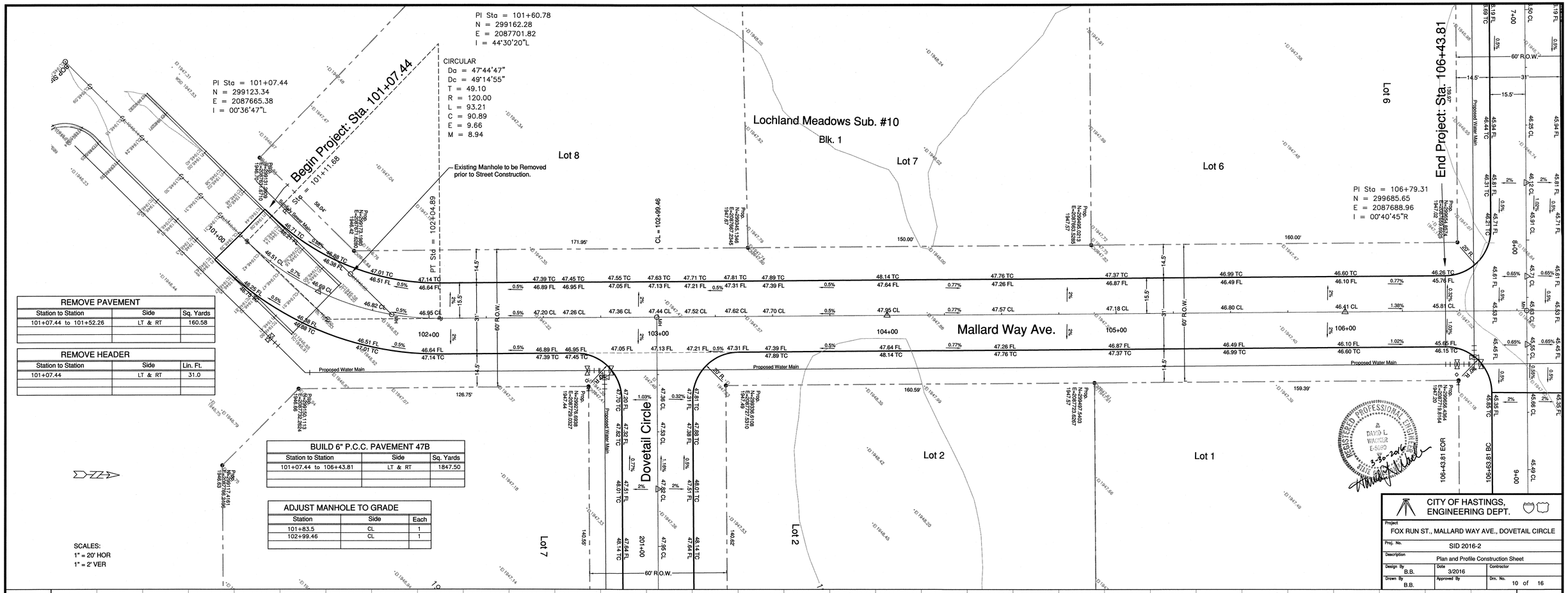
CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By B.B.	Date 3/2016
Contractor	
Drawn By B.B.	Approved By
Dn. No.	8 of 16



CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By	B.B.
Date	3/2016
Contractor	
Drawn By	B.B.
Approved By	
Drn. No.	9 of 16



REMOVE PAVEMENT		
Station to Station	Side	Sq. Yards
101+07.44 to 101+52.26	LT & RT	160.58

REMOVE HEADER		
Station to Station	Side	Lin. Ft.
101+07.44	LT & RT	31.0

BUILD 6" P.C.C. PAVEMENT 47B		
Station to Station	Side	Sq. Yards
101+07.44 to 106+43.81	LT & RT	1847.50

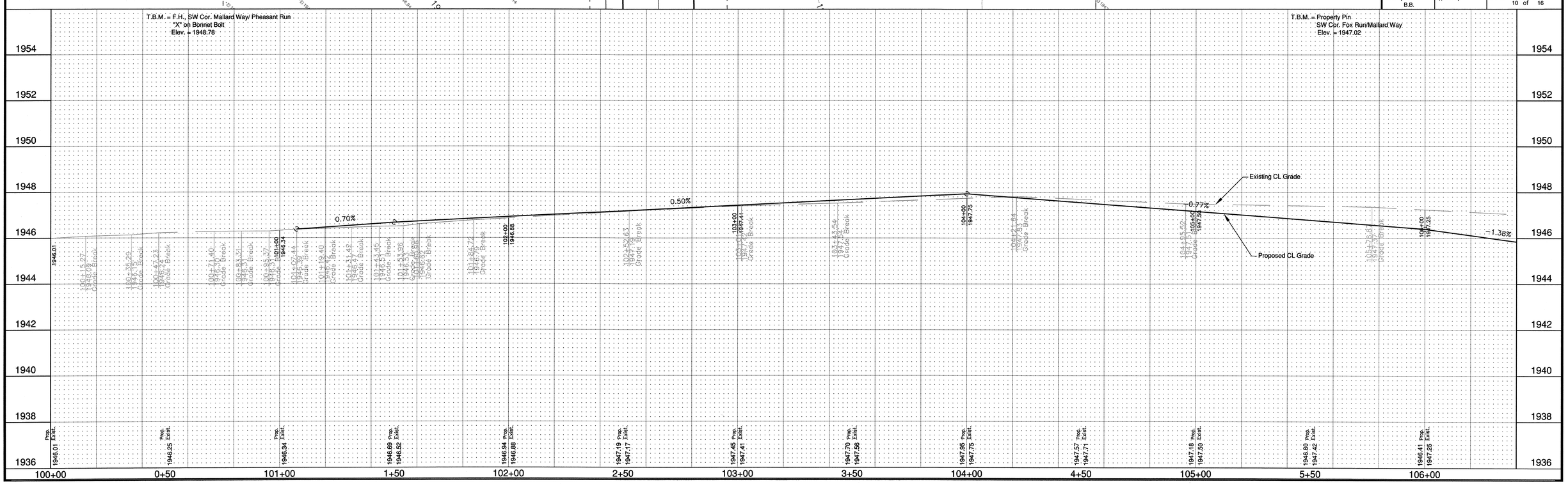
ADJUST MANHOLE TO GRADE		
Station	Side	Each
101+83.5	CL	1
102+99.46	CL	1

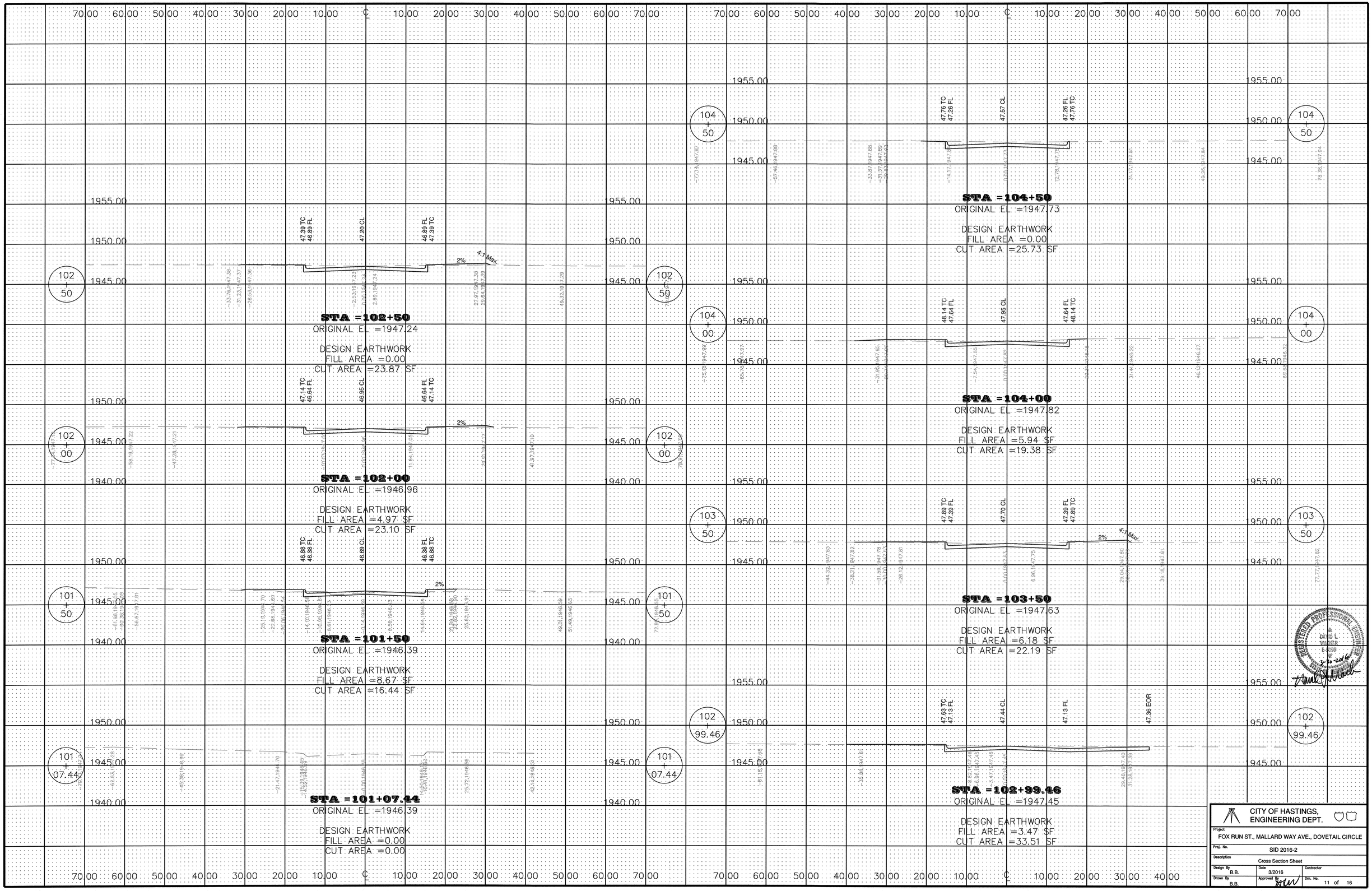
SCALES:
1" = 20' HOR
1" = 2' VER

REGISTERED PROFESSIONAL ENGINEER
DAVID L. WARNER
E-5080
STATE OF NEBRASKA
3-30-2016

CITY OF HASTINGS, ENGINEERING DEPT.

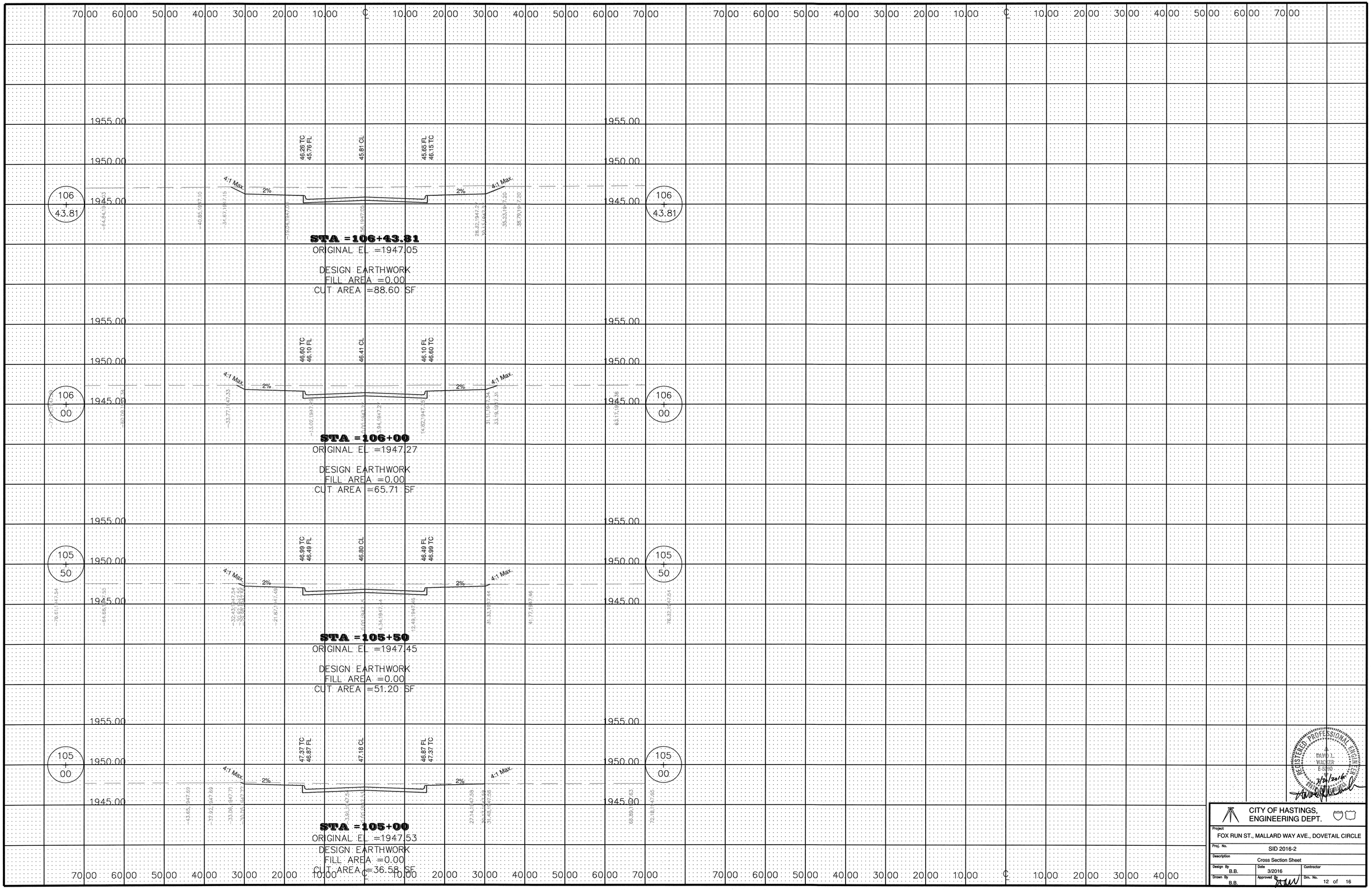
Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Plan and Profile Construction Sheet
Design By B.B.	Date 3/2016
Drawn By B.B.	Approved By
Contractor	
Dm. No.	10 of 16





CITY OF HASTINGS, ENGINEERING DEPT.

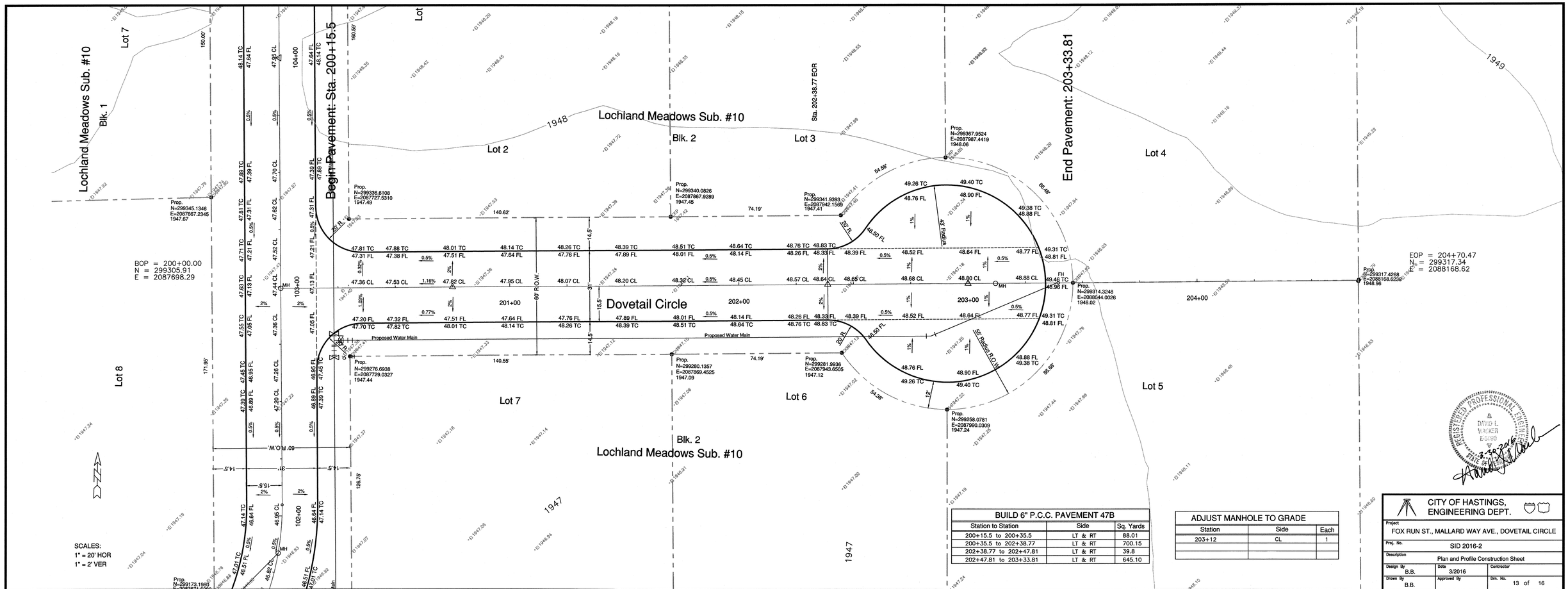
Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By B.B.	Date 3/2016
Contractor	
Drawn By B.B.	Approved By
Drn. No.	11 of 16



REGISTERED PROFESSIONAL ENGINEER
DAVID L. WACKER
E-5390
3/30/2016

CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By	B.B.
Date	3/2016
Contractor	
Drawn By	B.B.
Approved By	
Drn. No.	12 of 16



BUILD 6" P.C.C. PAVEMENT 47B		
Station to Station	Side	Sq. Yards
200+15.5 to 200+35.5	LT & RT	88.01
200+35.5 to 202+38.77	LT & RT	700.15
202+38.77 to 202+47.81	LT & RT	39.8
202+47.81 to 203+33.81	LT & RT	645.10

ADJUST MANHOLE TO GRADE		
Station	Side	Each
203+12	CL	1

CITY OF HASTINGS, ENGINEERING DEPT.

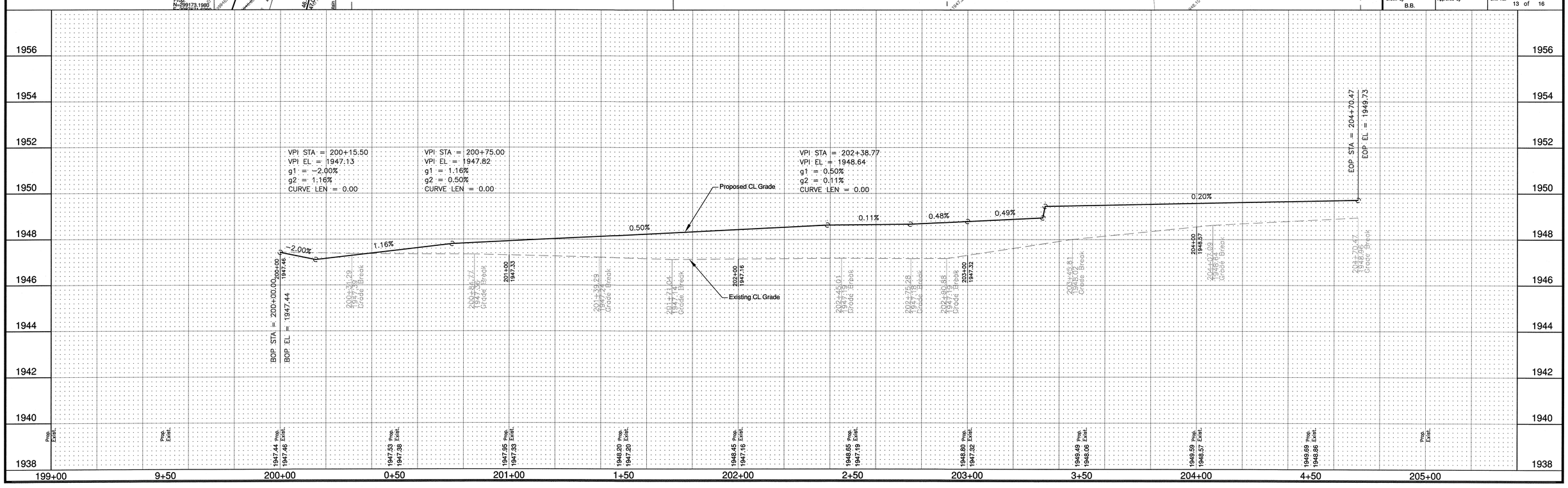
Project: FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE

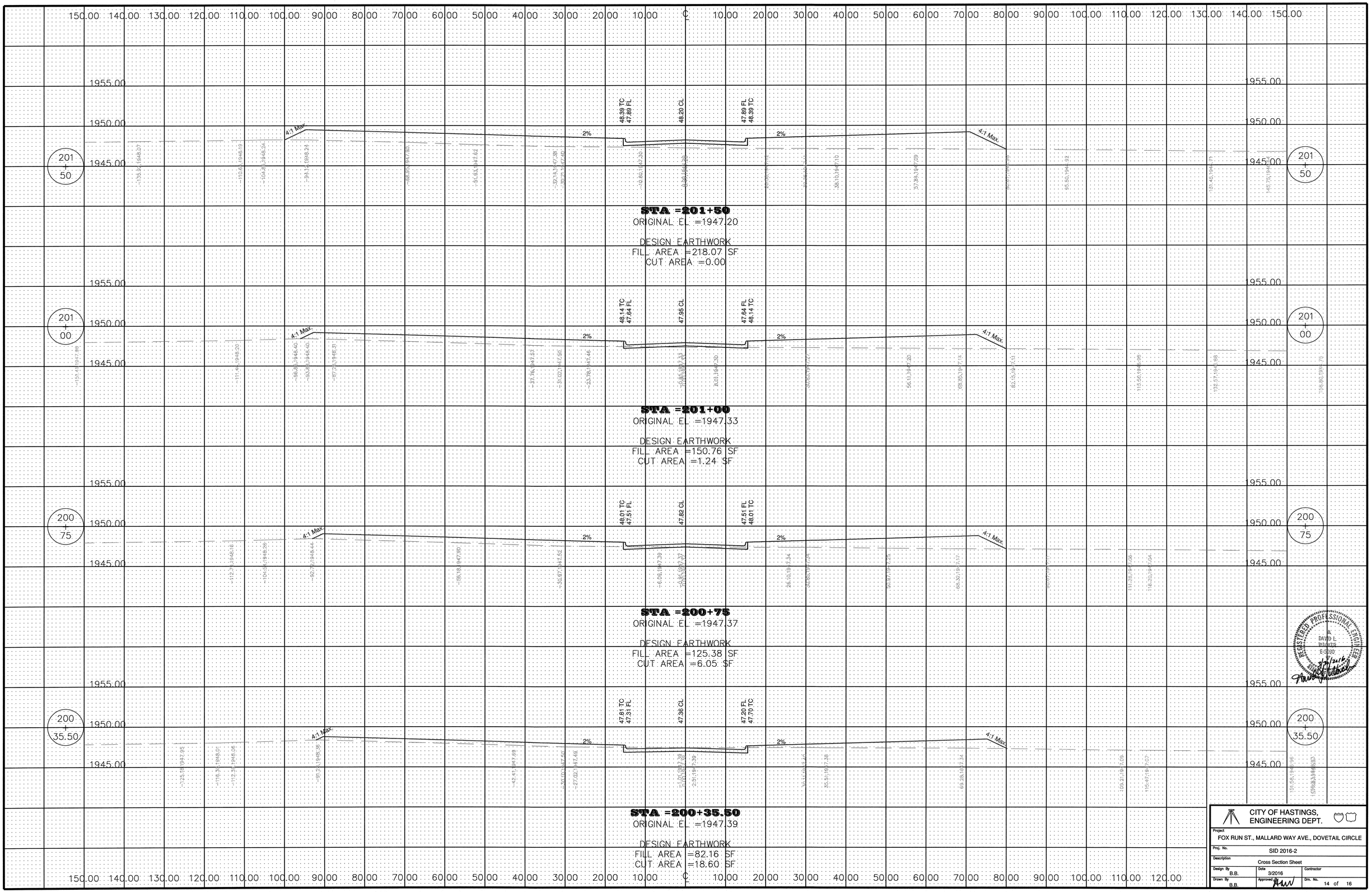
Proj. No.: SID 2016-2

Description: Plan and Profile Construction Sheet

Design By: B.B. | Date: 3/2016 | Contractor:

Drawn By: B.B. | Approved By: | Drn. No. 13 of 16

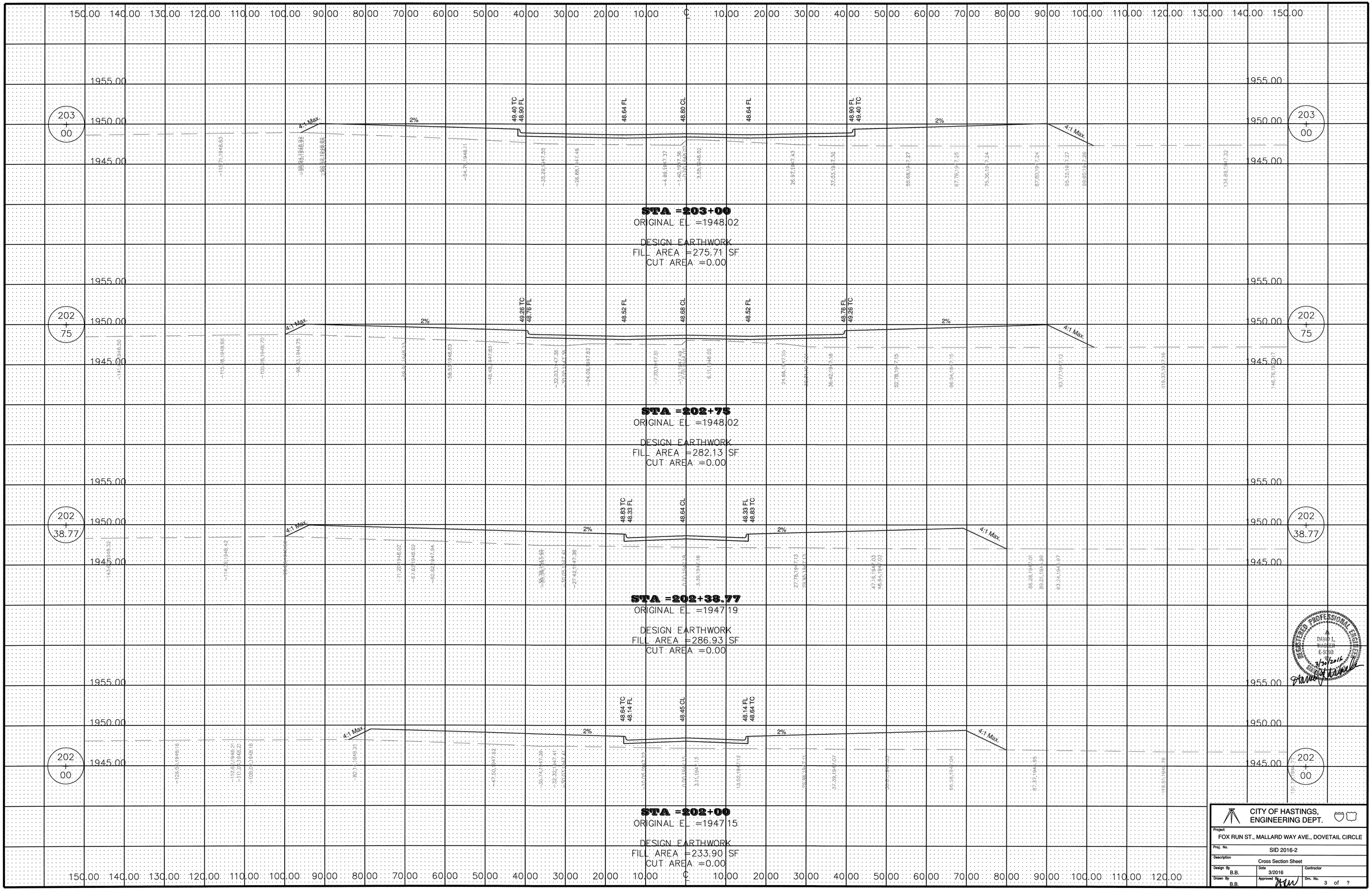




REGISTERED PROFESSIONAL ENGINEER
DAVID L. WARNER
E-5090
3/30/2016

CITY OF HASTINGS, ENGINEERING DEPT.

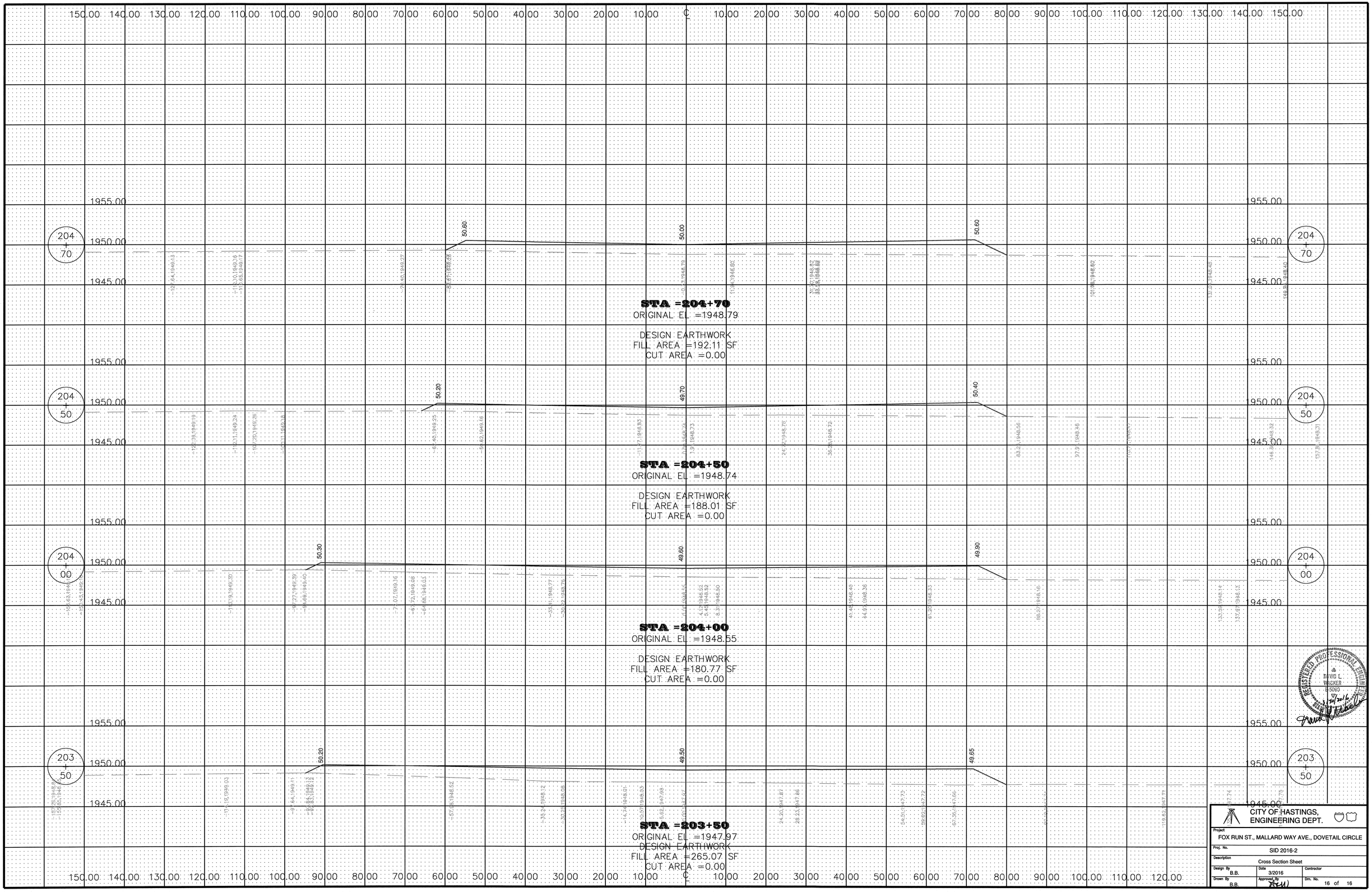
Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By	B.B.
Date	3/2016
Contractor	
Drawn By	B.B.
Approved By	
Drn. No.	14 of 16



REGISTERED PROFESSIONAL ENGINEER
DAVID L. WAGNER
E-5090
3/30/2016

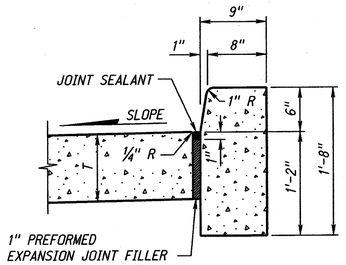
CITY OF HASTINGS, ENGINEERING DEPT.

Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By	B.B.
Date	3/2016
Contractor	
Drawn By	B.B.
Approved By	
Drn. No.	3 of ?



CITY OF HASTINGS,
ENGINEERING DEPT.

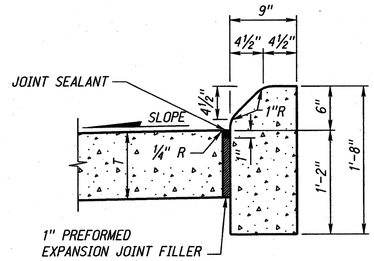
Project	FOX RUN ST., MALLARD WAY AVE., DOVETAIL CIRCLE
Proj. No.	SID 2016-2
Description	Cross Section Sheet
Design By: B.B.	Date: 3/2016
Contractor	
Drawn By: B.B.	Approved By:
Dm. No.	16 of 16



CONCRETE BARRIER CURB *

QUANTITIES

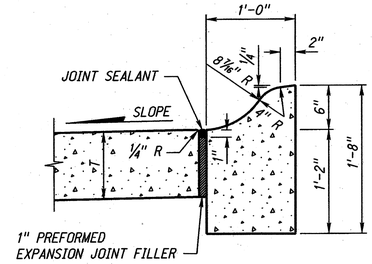
CONCRETE	4.55 CU. YDS./STA.
AREA	1.228 SQ. FT.



CONCRETE MEDIAN CURB *

QUANTITIES

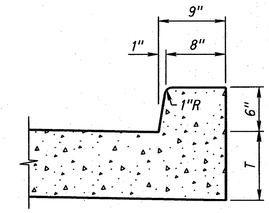
CONCRETE	4.42 CU. YDS./STA.
AREA	1.192 SQ. FT.



CONCRETE CURB, * TYPE I

QUANTITIES

CONCRETE	5.22 CU. YDS./STA.
AREA	1.408 SQ. FT.



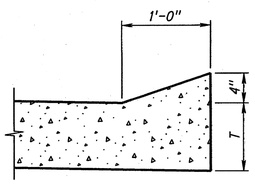
NOTE: MAY BE USED WHEN T IS LESS THAN 12"

INTEGRAL CONCRETE BARRIER CURB

QUANTITIES

CONCRETE	1.33 CU. YDS./STA.
AREA	0.359 SQ. FT.

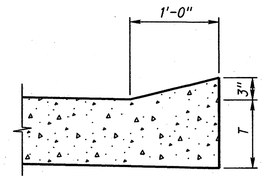
NOTE: * ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 100 FT. THRU CONCRETE BARRIER CURB, CONCRETE MEDIAN CURB, AND CONCRETE CURB, TYPE I.



INTEGRAL CONCRETE SLOPING CURB

QUANTITIES

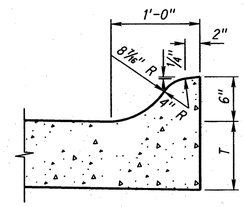
CONCRETE	0.62 CU. YDS./STA.
AREA	0.167 SQ. FT.



INTEGRAL CONCRETE SLOPING CURB

QUANTITIES

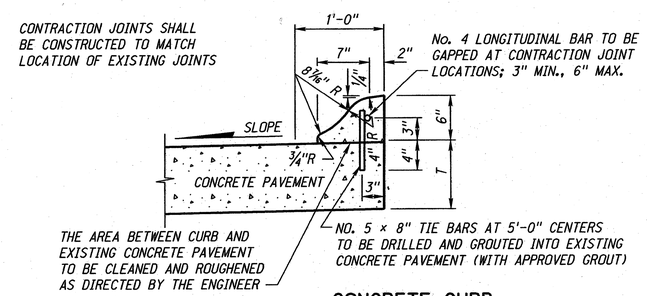
CONCRETE	0.46 CU. YDS./STA.
AREA	0.123 SQ. FT.



INTEGRAL CONCRETE CURB

QUANTITIES

CONCRETE	0.89 CU. YDS./STA.
AREA	0.239 SQ. FT.

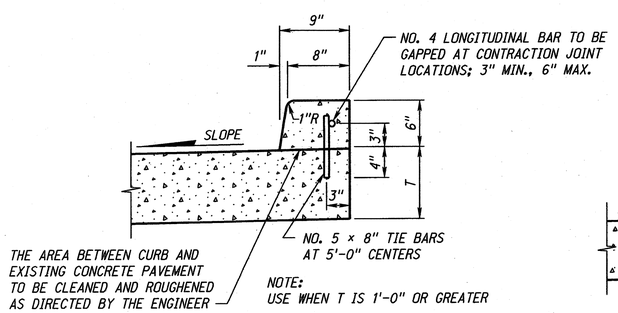


CONCRETE CURB, TYPE II

QUANTITIES

CONCRETE	0.87 CU. YDS./STA.
AREA	0.234 SQ. FT.

NOTE: T = PAVEMENT THICKNESS

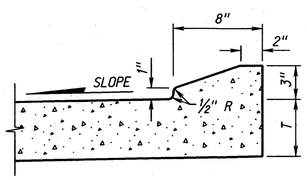


NOTE:
USE WHEN T IS 1'-0" OR GREATER

CONCRETE BARRIER CURB ALTERNATE

QUANTITIES

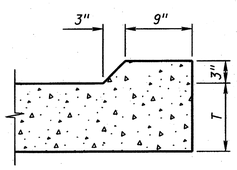
CONCRETE	1.33 CU. YDS./STA.
AREA	0.359 SQ. FT.



INTEGRAL CONCRETE TRUCK APRON CURB

QUANTITIES

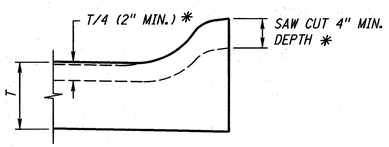
CONCRETE	0.47 CU. YDS./STA.
AREA	0.127 SQ. FT.



EROSION CONTROL CURB

QUANTITIES

CONCRETE	0.81 CU. YDS./STA.
AREA	0.219 SQ. FT.



CONTRACTION JOINT THRU CURB

* FOR NON-INTEGRAL CURB THE CONTRACTION JOINTS MAY BE MADE WITH A DOUBLE EDGER WHILE THE CONCRETE IS STILL PLASTIC.

REV. NO.	DATE	DESCRIPTION OF REVISION
R11	JUL 15	ADDED TRUCK APRON CURB
R10	FEB 09	MULTIPLE REVISIONS
R9	MAR 05	MULTIPLE REVISIONS

NEBRASKA DEPARTMENT OF ROADS

STANDARD PLAN NO. 301-R11

PAVEMENT DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

Howard A. Schwartz
4/6/15
DATE

PROFESSIONAL CIVIL ENGINEER
JAMES J. KNOTT
E-6035
3-12-69
STATE OF NEBRASKA

ORIGINAL:
JANUARY 31, 1974
DATE

1
3

ROADWAY DESIGN DIVISION

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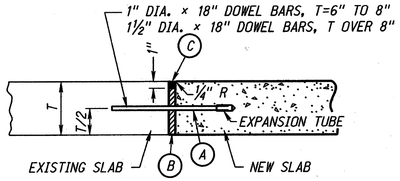
User: dcr13017

Date: 06-MAR-2015 14:29

File: 30100e11.dgn

Scale: 1:100

SHEET 1 OF 3



(A) GREASE DOWEL BAR ON EXPANSION TUB SIDE

(B) 1" PREFORMED EXPANSION JOINT FILLER

(C) JOINT SEALANT

NOTES:

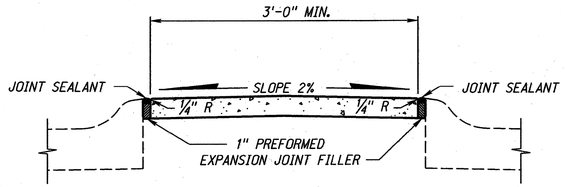
DOWEL BARS SHALL BE DRILLED TO A DEPTH OF 8" INTO EXISTING SLAB AND GROUTED.

DOWEL BARS SHALL BE PLACED AT 1'-0" CENTERS. THE OUTSIDE DOWEL BAR SHALL BE PLACED 6" FROM THE EDGE OF THE SLAB.

THIS JOINT SHALL BE CONSTRUCTED TRANSVERSE TO THE ROADWAY WHERE THE NEW CONCRETE ABUTS THE EXISTING CONCRETE.

DOWEL BARS SHALL BE PLACED PARALLEL TO THE ROADWAY ℄ AND TO THE ROADBED.

EXPANSION JOINT (SUBSIDIARY)



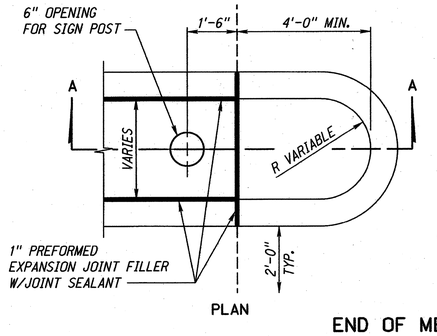
CONCRETE MEDIAN SURFACING

ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED ACROSS THE FULL WIDTH OF THE MEDIAN SURFACING AT INTERVALS OF NOT MORE THAN 49'-0".

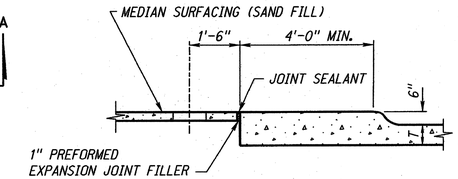
LONGITUDINAL JOINTS ONE INCH DEEP SHALL BE MADE IN ALL MEDIANS WHEN SURFACING WIDTH IS 16'-0" OR GREATER.

TRANSVERSE JOINTS ONE INCH DEEP SHALL BE MADE IN ALL MEDIANS AT INTERVALS OF NOT MORE THAN 8'-0".

TRANSVERSE AND LONGITUDINAL JOINTS SHALL NOT BE FILLED.

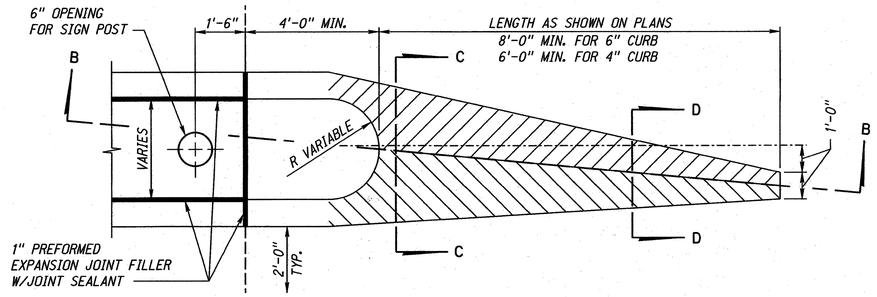


PLAN

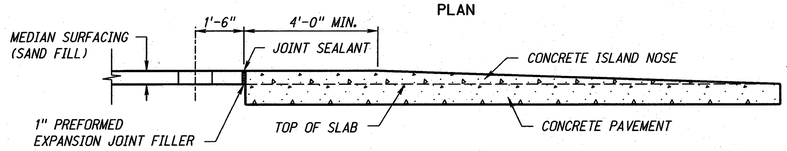


SECTION A-A

END OF MEDIAN ISLAND



PLAN



SECTION B-B

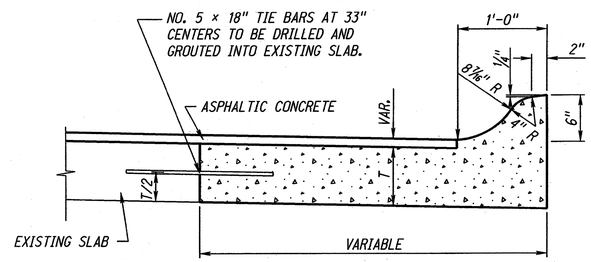
SECTION C-C

SECTION D-D

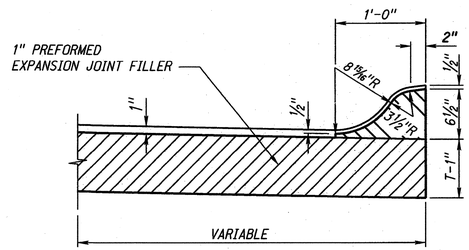
CONCRETE ISLAND NOSE

NOTE:
EXISTING CONCRETE PAVEMENT IS TO BE REMOVED TO BUILD CONCRETE ISLAND NOSE.

NOTE: T = PAVEMENT THICKNESS



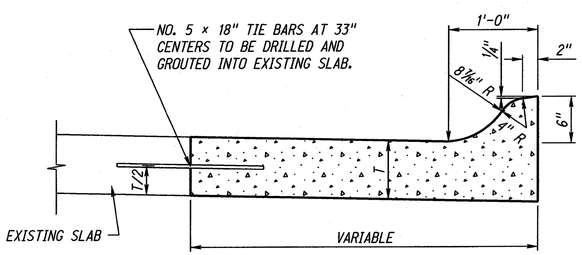
CONCRETE BASE COURSE W/INTEGRAL CURB



ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERSECTION RETURNS AND WHERE SHOWN ON THE PLANS. TRANSVERSE JOINTS SHALL BE PROVIDED EVERY 8'-0" OR WHERE SHOWN ON THE PLANS.

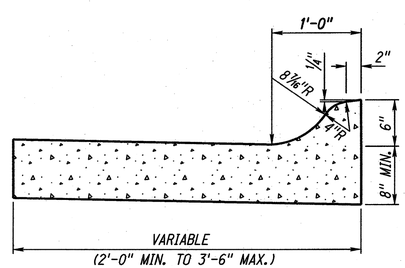
NOTE: RECESS THE EXPANSION JOINT FILLER ½" FROM THE TOP SURFACE OF THE CURB TYPE UNDER CONSTRUCTION

DETAIL FOR CUTTING EXPANSION JOINT FILLER

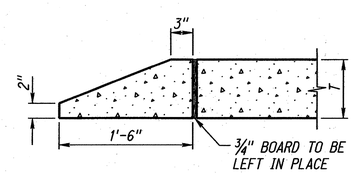


THE FOLLOWING NOTE IS TYPICAL FOR CONCRETE BASE COURSE W/INTEGRAL CURB AND CONCRETE PAVEMENT WIDENING: CONTRACTION AND EXPANSION JOINTS SHALL BE CONSTRUCTED TO MATCH LOCATIONS OF EXISTING JOINTS.

CONCRETE PAVEMENT WIDENING



COMBINATION CONCRETE CURB & GUTTER



CONCRETE HEADER

REV. NO.	DATE	DESCRIPTION OF REVISION
R11	JUL 15	ADDED TRUCK APRON CURB
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R9	MAR 05	MULTIPLE REVISIONS

NEBRASKA DEPARTMENT OF ROADS

STANDARD PLAN NO. 301-R11

PAVEMENT DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

Howard A. Schwartz
4/6/15
DATE

PROFESSIONAL ENGINEER JAMES A. KNOTT E-6035 4/6/15 STATE OF NEBRASKA

ORIGINAL:
JANUARY 31, 1974
DATE

2/3

ROADWAY DESIGN DIVISION

Computer: DRDESIGN147 User: dor13017 Date: 06-MAR-2015 14:19

File: 30100e11.dgn Scale: 1:100 SHEET 2 OF 3

ROADWAY DESIGN DIVISION
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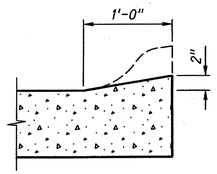
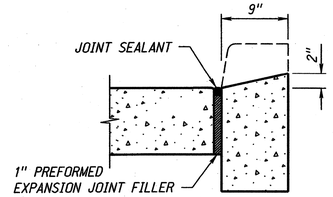
User: dor13017
Date: 06-MAR-2015 14:19
File: 30100e11.dgn
Scale: 1:100
SHEET 3 OF 3

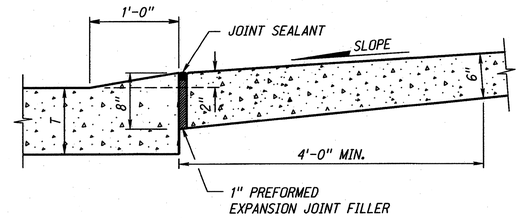


INTEGRAL CURB

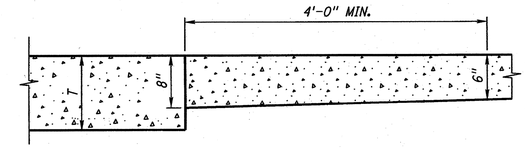


BARRIER CURB

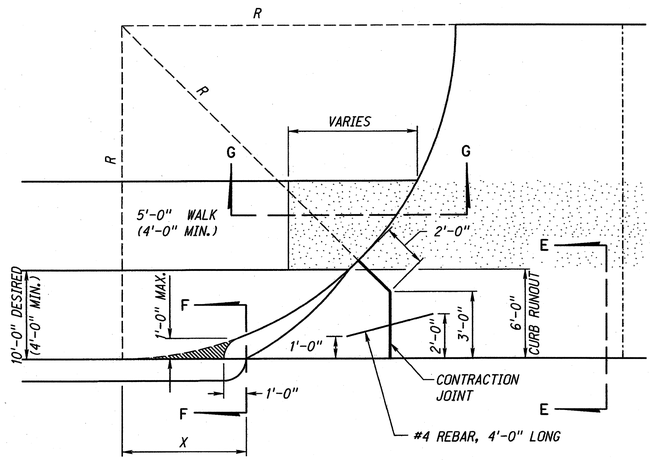
DETAILS OF CURB DROPS



SECTION E-E



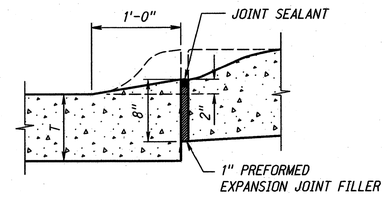
(RURAL DRIVEWAY)



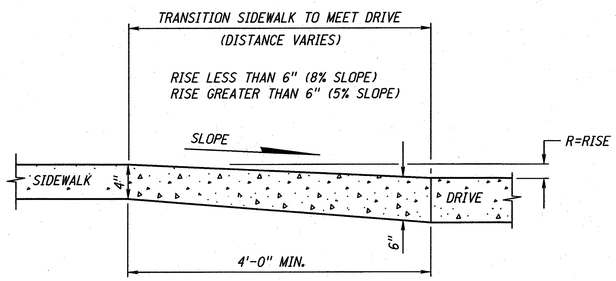
URBAN DRIVEWAY PLAN

R	X
5'-0"	3.00'
10'-0"	4.36'
15'-0"	5.38'
20'-0"	6.24'
25'-0"	7.00'
30'-0"	7.68'
35'-0"	8.31'
40'-0"	8.89'

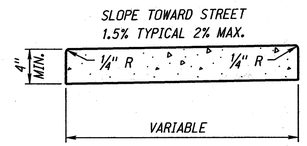
R = RADIUS
$X = \sqrt{(2R-1)}$
(X & R IN FEET)



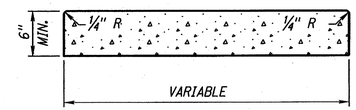
SECTION F-F



SECTION G-G



SIDEWALK

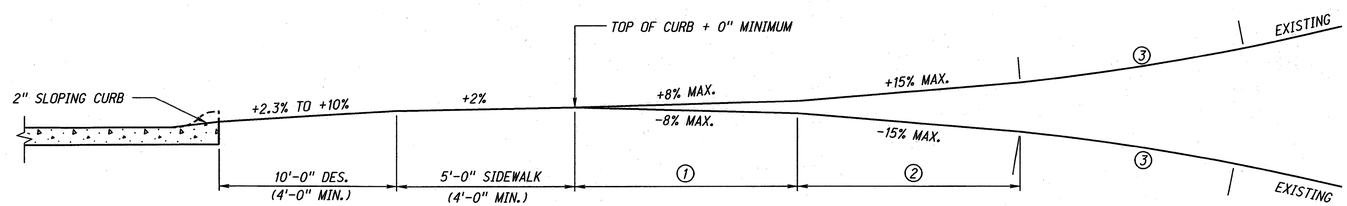


SIDEWALK AT DRIVEWAY

NOTE:

1" PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED IN ALL SIDEWALKS OR CROSSWALKS AT INTERVALS OF NOT MORE THAN 50'-0", AND AT ALL POINTS WHERE SIDEWALKS OR CROSSWALKS ARE ADJACENT TO CURB. IF SIDEWALK OR CROSSWALK TO BE CONSTRUCTED IS LESS THAN 50'-0" IN LENGTH, ONE SUCH EXPANSION JOINT SHALL BE PLACED AS DIRECTED BY THE ENGINEER.

NOTE: T = PAVEMENT THICKNESS



PROFILE URBAN DRIVEWAY WITH SIDEWALK (MAXIMUM PERCENT OF GRADE)

1. 10'-0" MINIMUM IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±8%
2. 10'-0" MINIMUM IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±15%
3. 10'-0" MINIMUM ROUNDING IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±22%

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ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

4/6/15
DATE

ORIGINAL:
JANUARY 31, 1974
DATE

3/3

ROADWAY DESIGN DIVISION
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User: dor13182
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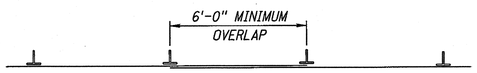
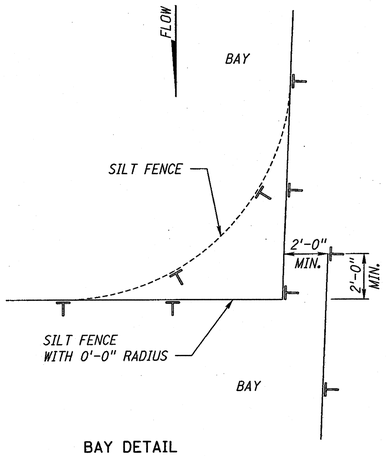
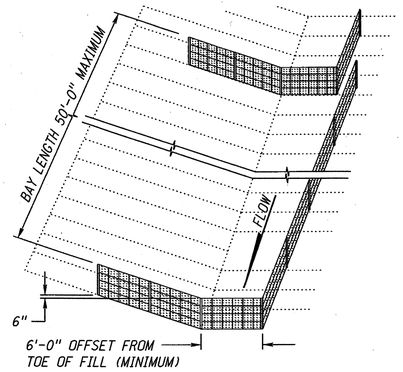


SILT FENCE SPLICE

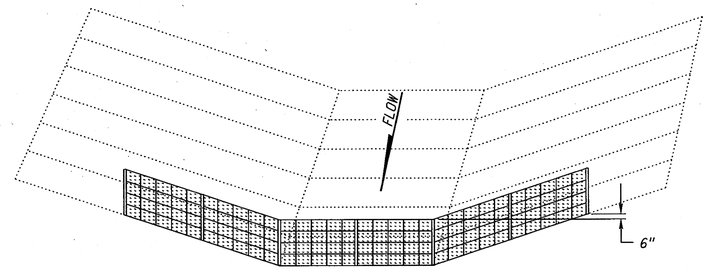


BAY DETAIL

NOTE:
SILT FENCE AT CORNERS SHALL HAVE A RADIUS OF 0'-0" MINIMUM TO 10'-0" MAXIMUM

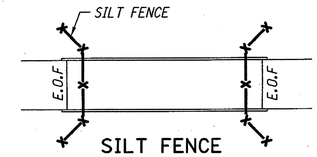


SILT FENCE BAYS

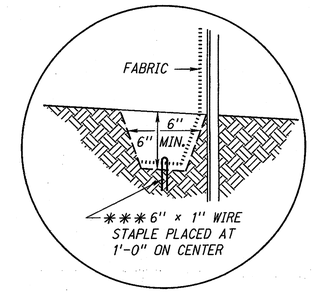


HIGH POROSITY SILT FENCE
(ACROSS DITCH)

NOTE:
POST SPACING 6'-0" MAXIMUM MULTIPLE BAYS MAY BE USED

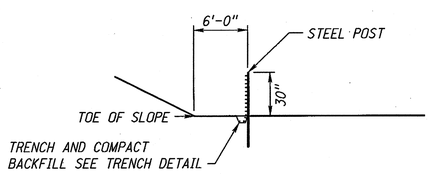


SILT FENCE
(UNDER BRIDGE)

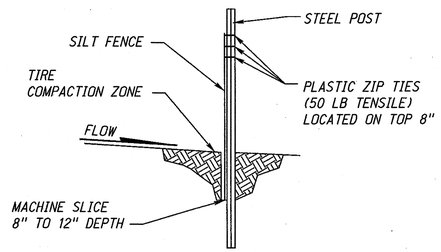


TRENCH DETAIL

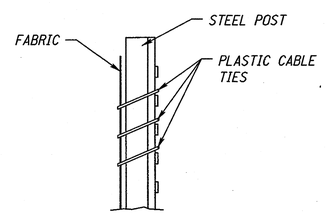
✱✱✱ SILT FENCE MAY ALSO BE INSTALLED WITH A SILT FENCE PLOW. NO STAPLING IS REQUIRED WHEN THE SILT FENCE PLOW IS USED.



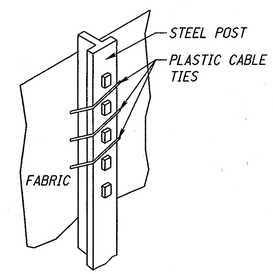
OPTION ONE (PREFERED)
SILT FENCE
(6'-0" OFFSET FROM TOE OF FILL)



SILT FENCE MACHINE SLICED



PROFILE VIEW
ATTACHMENT TO POST



BACK VIEW
ATTACHMENT TO POST

NOTES:

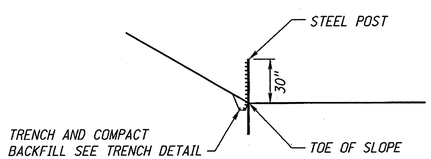
SILT FENCE SHOULD BE 30" ABOVE GRADE (MAY VARY)

SILT FENCE MINIMUM ROLL WIDTH:
LOW POROSITY = 42"
HIGH POROSITY = 42"
LOW PROFILE = 36"
COIR SILT FENCE = 36"

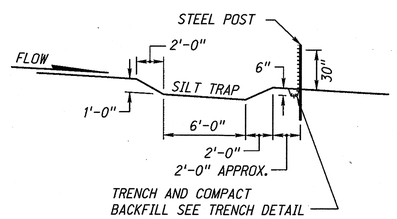
STEEL STUDDED "T" LINE POSTS 5'-6" LENGTH; 6'-0" MAXIMUM SPACING.

FOR EACH STEEL STUDDED "T" LINE POST, 3 PLASTIC CABLE TIES ARE REQUIRED.

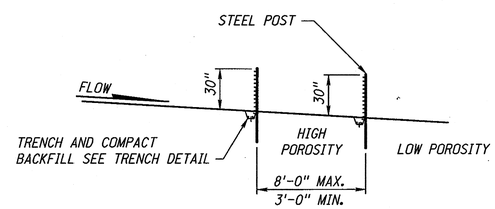
2" × 2" × 6'-0" NOMINAL WOOD STAKES SPACING, 6'-0" MAXIMUM ON CENTER DRIVEN UNTIL FIRM.



OPTION TWO (WITH LIMITED R.O.W.)
SILT FENCE
(AT TOE OF FILL)



HIGH POROSITY SILT
FENCE WITH SILT TRAP
(ACROSS DITCH)



SILT FENCE
(ACROSS DITCH)

REV. NO.	DATE	DESCRIPTION OF REVISION
R1	APR 14	STEEL POST INSTALLATION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 502-R1

SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. BOWEN
E-6515
STATE OF NEBRASKA

11/8/13
DATE

ORIGINAL:
DECEMBER 18, 2006
DATE

1
2

ROADWAY DESIGN DIVISION
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User: dor13182
Date: 28-OCT-2013 09:06
File: 50200e01.dgn
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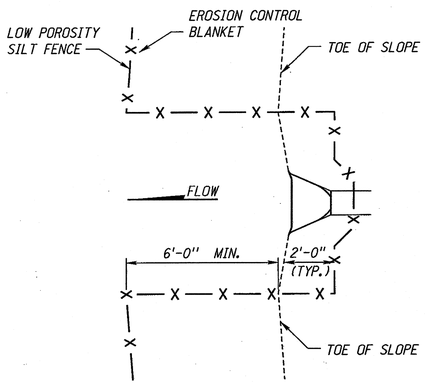
SHEET 2 OF 2



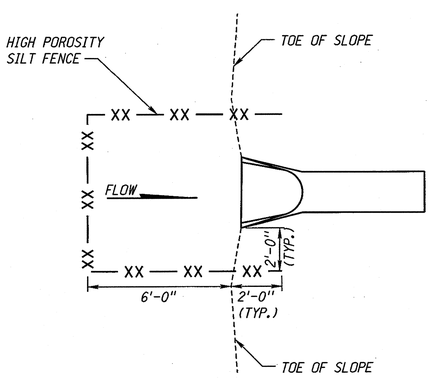
SILT FENCE OUTLET PROTECTION

NOTES:

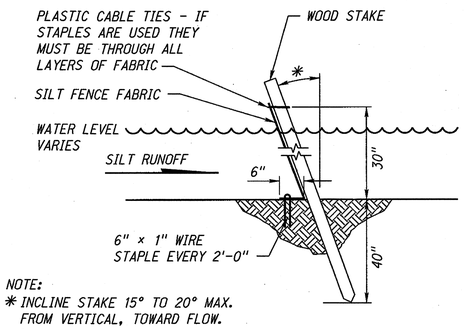
1. SILT FENCE SHOULD BE BROUGHT FLUSH WITH WING WALLS ON BOX CULVERTS IF IT CAN NOT BE INSTALLED ABOVE THE BOX CULVERT.

2. IF APPLICABLE, SILT FENCE AROUND THE CULVERT SHOULD BE ADJUSTED TO ALLOW FOR THE INSTALLATION OF EROSION CONTROL AS SHOWN IN STANDARD PLAN 501.

3. SILT CHECKS MAY USED IN PLACE OF SILT FENCE ABOVE THE OPENING OF A CULVERT, AS SHOWN IN SPECIAL PLAN C.

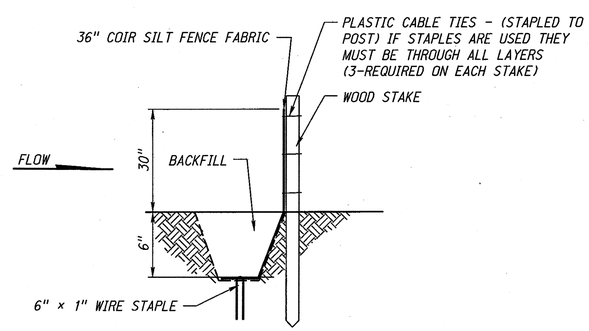


SILT FENCE INLET PROTECTION

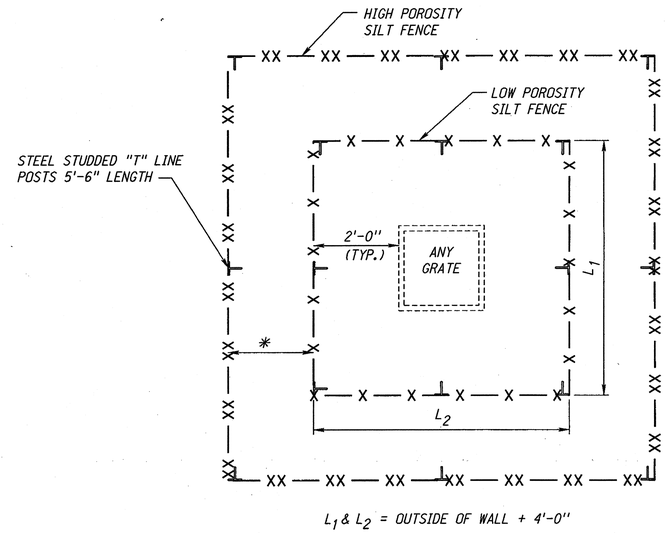


NOTE:
* INCLINE STAKE 15° TO 20° MAX. FROM VERTICAL, TOWARD FLOW.

SILT FENCE
(WET & BELOW WATER INSTALLATION)



COIR SILT FENCE - ON WOOD POSTS - DRY INSTALLATION

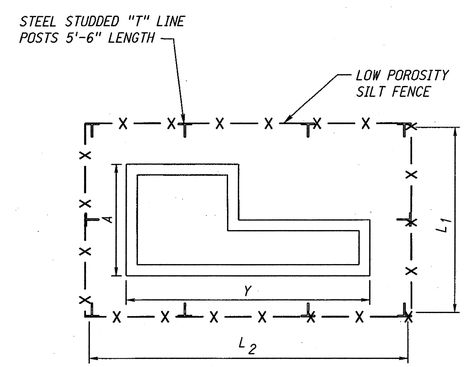


L_1 & L_2 = OUTSIDE OF WALL + 4'-0"

PLAN VIEW

SILT FENCE FOR GRATE, AREA, MEDIAN INLETS OR JUNCTION BOXES

** 3'-0" IF POSSIBLE (MAY VARY)*



$L_1 = A + 6'-0"$
$L_2 = Y + 6'-0"$

PLAN VIEW

SILT FENCE CURB INLET

REV. NO.	DATE	DESCRIPTION OF REVISION
R1	APR 14	STEEL POST INSTALLATION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 502-R1

SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

11/8/13
DATE

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA

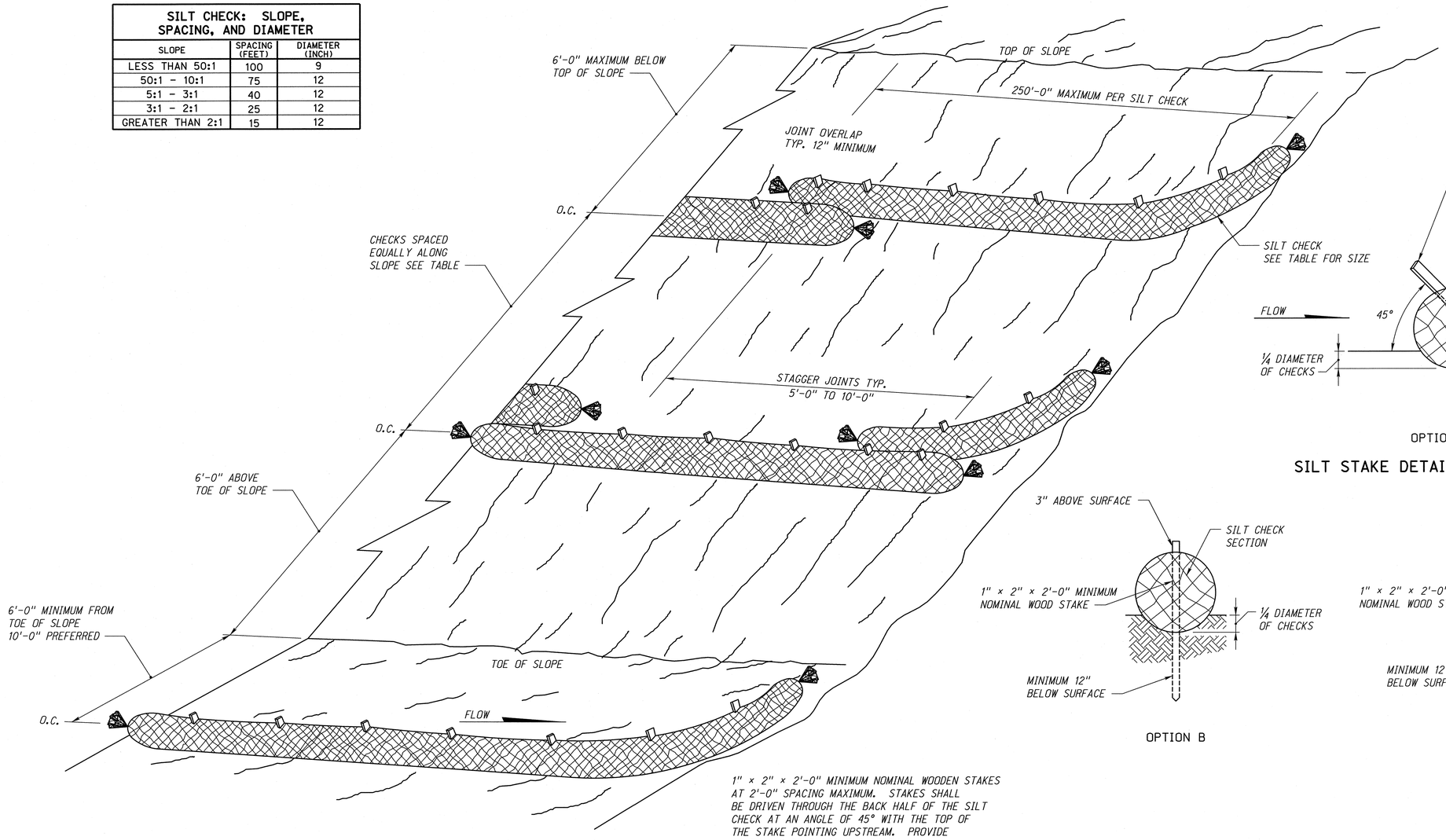
ORIGINAL:
DECEMBER 18, 2006
DATE

2
2

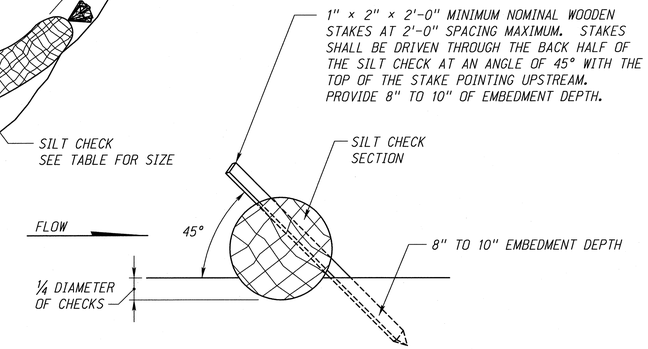
PROJECT NO.	SHEET NO.

C.N.

SILT CHECK: SLOPE, SPACING, AND DIAMETER		
SLOPE	SPACING (FEET)	DIAMETER (INCH)
LESS THAN 50:1	100	9
50:1 - 10:1	75	12
5:1 - 3:1	40	12
3:1 - 2:1	25	12
GREATER THAN 2:1	15	12



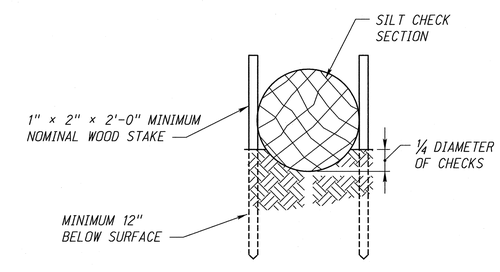
SLOPE APPLICATION
PERSPECTIVE VIEW



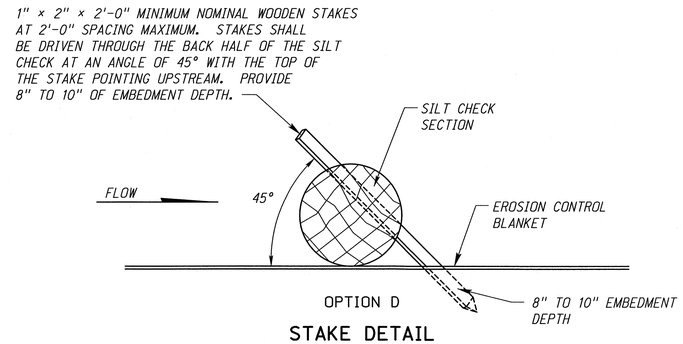
OPTION A

SILT STAKE DETAIL (WITH TRENCH)

OPTION B



OPTION C



OPTION D

STAKE DETAIL
(NO TRENCH)

NOTE:

TRENCHING IS OPTIONAL FOR CHECKS ON BACKSLOPES & FORESLOPES

PROFESSIONAL LANDSCAPE ARCHITECT
RONALD E. POE
L.A. 275
REGISTERED
STATE OF NEBRASKA

SILT CHECKS ALL TYPES

SHEET 1 OF 4

SPECIAL PLAN C

ROADWAY DESIGN DIVISION

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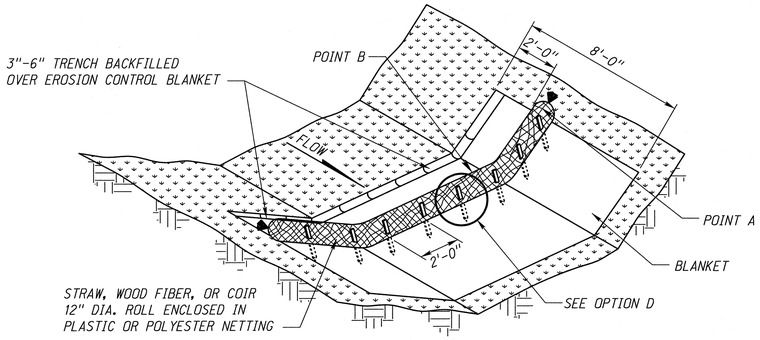
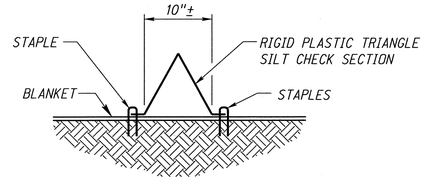
SHEET 1 OF 4

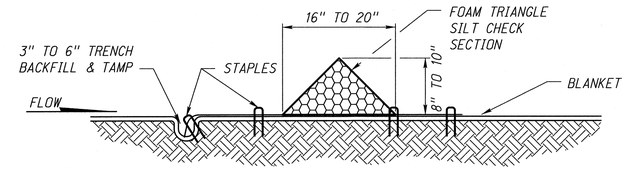
PROJECT NO.	SHEET NO.
C.N.	



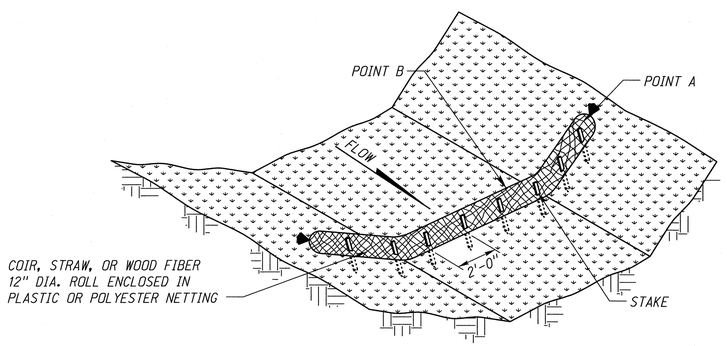
TYPE 2 & 3: HIGH & LOW
WITH EROSION CONTROL



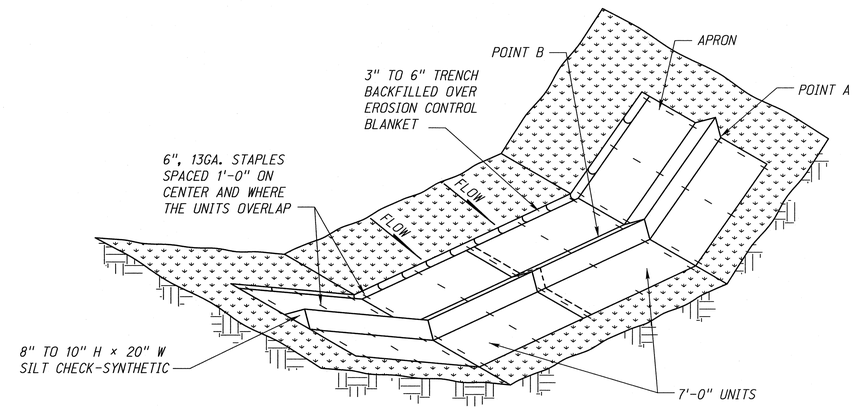
TYPE 4 SECTION



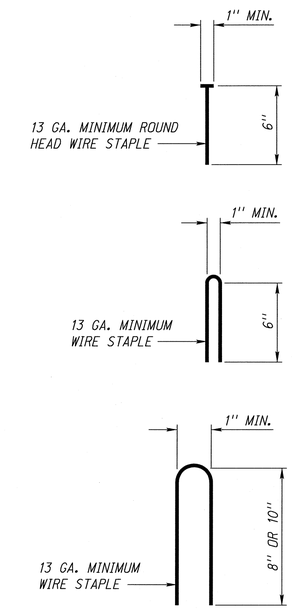
TYPE 4 SECTION



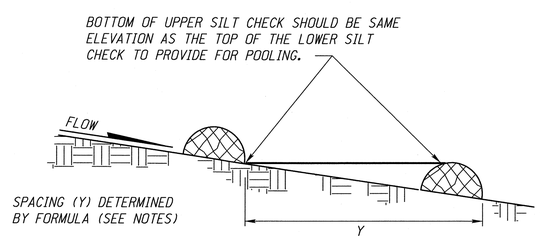
TYPE 1, 2 & 3: HIGH & LOW
USE ON ROUGH GRADED & BARE SOIL AREAS



SILT CHECK: TYPE 4



WIRE STAPLE DETAIL



SILT CHECK SPACING-DITCH

NOTES:

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{SILT CHECK HEIGHT (FT.)}}{\text{\% CHANNEL SLOPE}} \times 100$$

POINT A MUST BE A MINIMUM OF 6" HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE CHECK AND NOT AROUND THE ENDS.

PERMANENT ROCK CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 10:1 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

THE TRENCH ON THE UPSTREAM SIDE OF THE SILT CHECK IS NOT REQUIRED IF THE EROSION CONTROL BLANKET CONTINUES IN THE ENTIRE LENGTH OF THE DITCH.

THE MANUFACTURERS RECOMMENDED INSTALLATION DETAILS SHALL GOVERN OVER THE PLANS.

SEE STAKING DETAIL SHEET 1 OF 4

PROFESSIONAL LANDSCAPE ARCHITECT
RONALD E. POE
L.A. 275
REGISTERED
STATE OF NEBRASKA

SILT CHECKS ALL TYPES

SHEET 2 OF 4

SPECIAL PLAN C

ROADWAY DESIGN DIVISION
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User: dor13017
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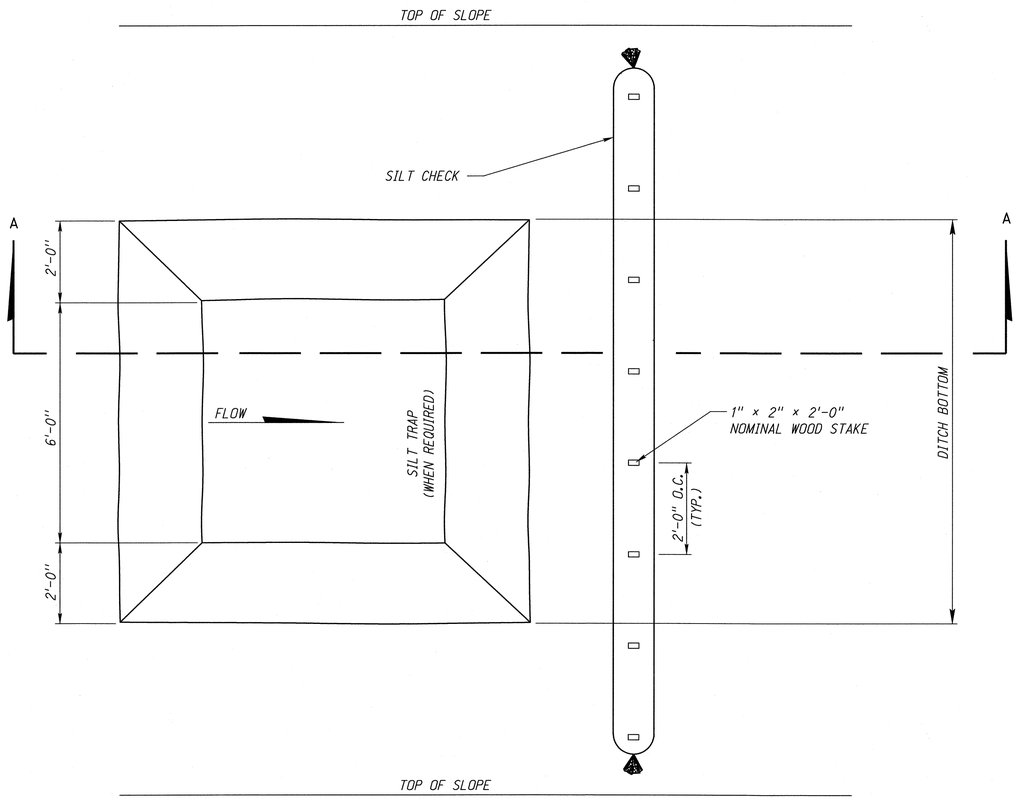
SHEET 2 OF 4

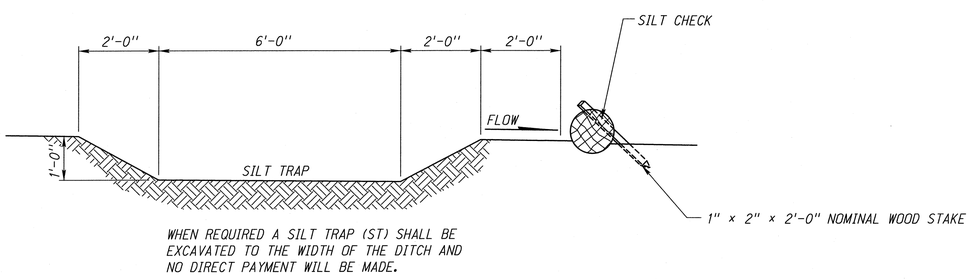
PROJECT NO.	SHEET NO.

C.N.



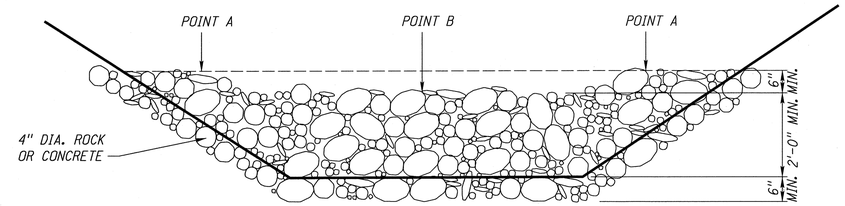
PLAN VIEW

FOR FLAT BOTTOM DITCH



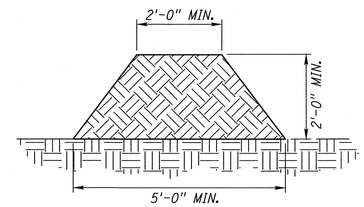
WHEN REQUIRED A SILT TRAP (ST) SHALL BE EXCAVATED TO THE WIDTH OF THE DITCH AND NO DIRECT PAYMENT WILL BE MADE.

SECTION A-A



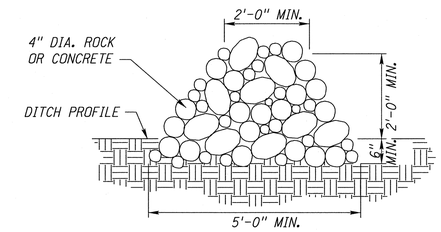
ROCK CHECK

ELEVATION VIEW



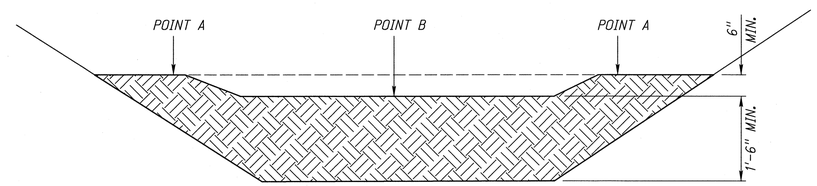
EARTH-SLASH MULCH PERIMETER BERM

CROSS SECTION



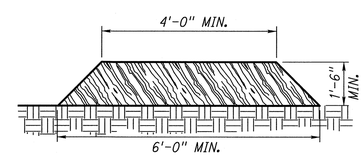
ROCK CHECK

CROSS SECTION



EARTH-SLASH MULCH CHECK

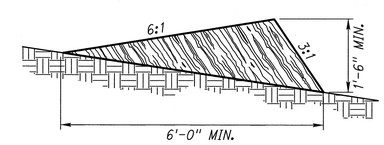
ELEVATION VIEW



CROSS SECTION

SILT CHECK-SLASH MULCH

OPTION A



CROSS SECTION

SILT CHECK-SLASH MULCH

OPTION B

PROFESSIONAL LANDSCAPE ARCHITECT
RONALD E. POE
L.A. 275
REGISTERED
STATE OF NEBRASKA

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES

SHEET 3 OF 4

SPECIAL PLAN C

ROADWAY DESIGN DIVISION

Computer: DRDESIGN55

User: dar13017

Date: 13-DEC-2013 12:38

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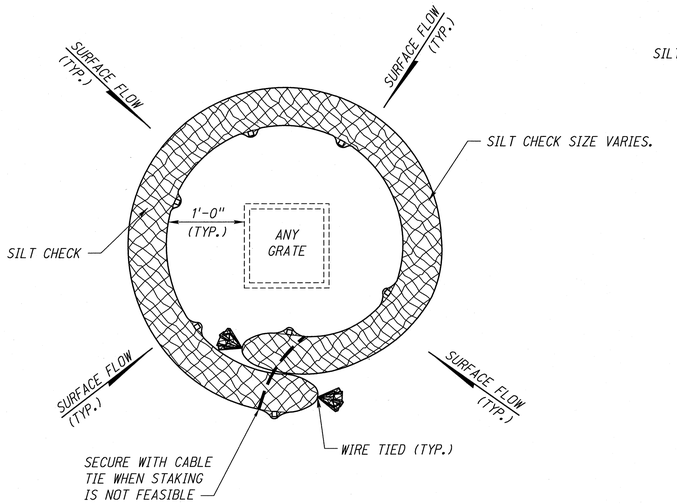
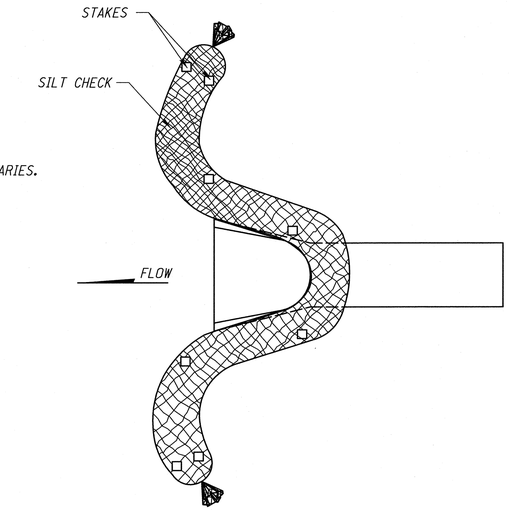
SHEET 3 OF 4

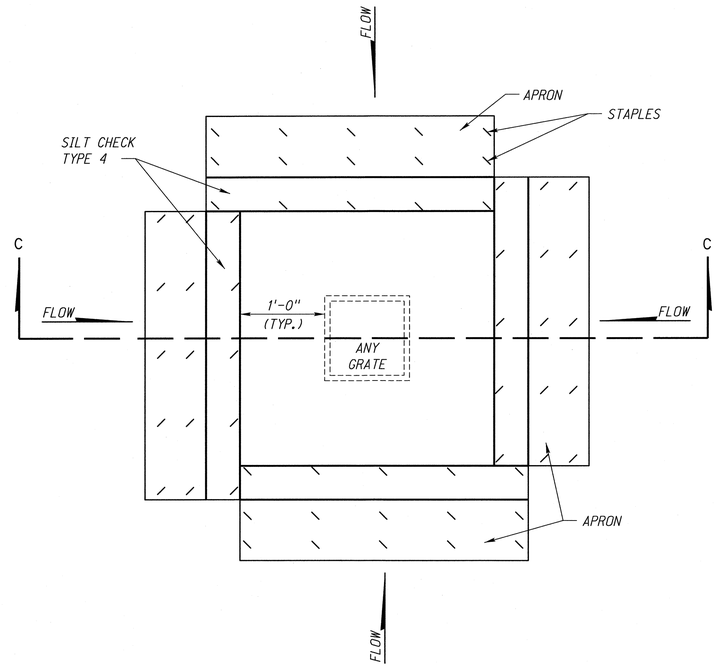
PROJECT NO.	SHEET NO.
C.N.	



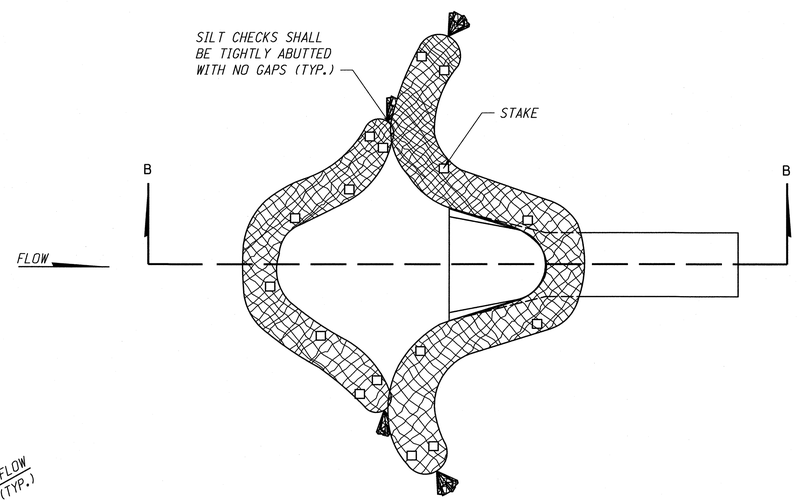
PLAN VIEW



SILT CHECK OUTLET PROTECTION

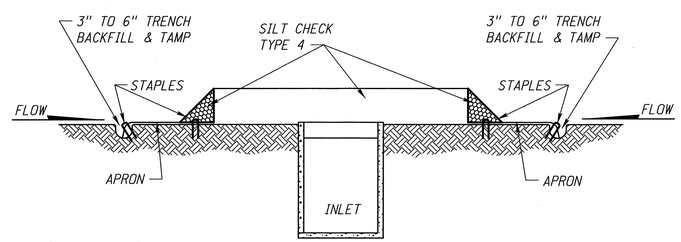


PLAN VIEW



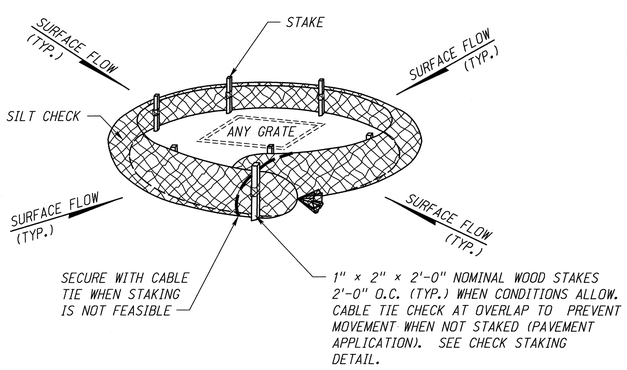
PLAN VIEW

SILT CHECK INLET PROTECTION



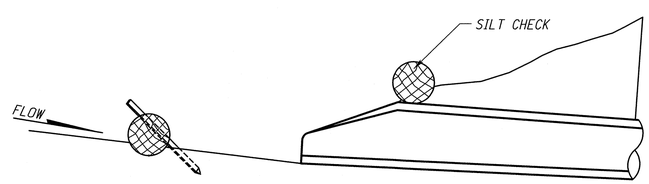
SECTION C-C

SILT CHECK TYPE 4 AT INLET



SILT CHECK INLET FILTER

PERSPECTIVE VIEW



SECTION B-B

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES

SHEET 4 OF 4

SPECIAL PLAN C

ROADWAY DESIGN DIVISION

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SHEET 4 OF 4

ROADWAY DESIGN DIVISION
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SHEET 1 OF 3

CHANNELIZATION DEVICES

THE FUNCTION OF CHANNELIZATION DEVICES IS TO WARN ROAD USERS OF CONDITIONS CREATED BY WORK ACTIVITIES IN OR NEAR THE TRAVELED WAY, TO PROTECT WORKERS IN THE TEMPORARY TRAFFIC CONTROL ZONE, AND TO GUIDE DRIVERS AND PEDESTRIANS SAFELY. CHANNELIZING DEVICES INCLUDE BUT ARE NOT LIMITED TO CONES, TUBULAR POSTS, VERTICAL PANELS, DRUMS, BARRICADES, TRAFFIC LANE DIVIDERS, TEMPORARY RAISED ISLANDS, AND BARRIERS.

DEVICES USED FOR CHANNELIZATION SHOULD PROVIDE FOR SMOOTH AND GRADUAL TRAFFIC MOVEMENT FROM ONE LANE TO ANOTHER, ONTO A BYPASS OR DETOUR, OR TO REDUCE THE WIDTH OF THE TRAVELED WAY. THEY MAY ALSO BE USED TO SEPARATE TRAFFIC FROM THE WORK SPACE, PAVEMENT DROP-OFFS, PEDESTRIAN PATHS, OR OPPOSING DIRECTIONS OF TRAFFIC.

CHANNELIZING DEVICES SHALL MEET THE CRASHWORTHY PERFORMANCE CRITERIA CONTAINED IN THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). THEY SHOULD BE CONSTRUCTED AND BALLASTED TO PERFORM IN A PREDICTABLE MANNER WHEN INADVERTENTLY STRUCK BY A VEHICLE. IF STRUCK, THE DEVICE SHOULD YIELD OR BREAK AWAY, FRAGMENTS OR OTHER DEBRIS FROM THE DEVICE SHOULD NOT PENETRATE THE PASSENGER COMPARTMENT OF THE VEHICLE OR BE A POTENTIAL HAZARD TO WORKERS OR PEDESTRIANS IN THE IMMEDIATE AREA.

SPACING OF CHANNELIZING DEVICES SHOULD NOT EXCEED A DISTANCE IN FEET EQUAL TO THE SPEED WHEN USED FOR THE TAPER CHANNELIZATION, AND A DISTANCE IN FEET OF TWICE THE SPEED WHEN USED FOR TANGENT CHANNELIZATION.

SPACING OF CHANNELIZATION DEVICES		
SPEED (MPH)	SPACING OF DEVICES (FEET)	
S	TAPER	TANGENT
25	25	50
35	35	70
45	45	90
55	55	110
60	60	120
65	65	130
75	75	150

WARNING LIGHTS MAY BE ADDED TO CHANNELIZING DEVICES IN AREAS WITH FREQUENT FOG, SNOW, OR SEVERE ROADWAY CURVATURE, OR WHERE VISUAL DISTRACTIONS ARE PRESENT, EXCEPT FOR THE SEQUENTIAL FLASHING WARNING LIGHTS, WARNING LIGHTS PLACED ON CHANNELIZING DEVICES USED IN A SERIES TO CHANNELIZE ROAD USERS SHALL BE STEADY-BURN.

THE RETROREFLECTIVE MATERIAL USED ON CHANNELIZING DEVICES SHALL HAVE A SMOOTH, SEALED OUTER SURFACE, MEETING THE REQUIREMENTS OF THE ASTM SPECIFICATION D4956, FOR TYPE IV SHEETING OR TYPE V REBOUNDABLE SHEETING (OR GREATER).

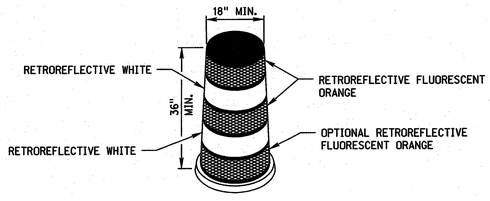
COEFFICIENT OF RETROREFLECTION ($CD/LUX/M^2$)			
WHITE	ORANGE	RED	YELLOW
250	100	45	170

THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) "QUALITY GUIDELINES FOR WORK ZONE TRAFFIC CONTROL DEVICES" SHALL BE USED AS A VISUAL GUIDE FOR DETERMINING IF A TRAFFIC CONTROL DEVICE/OR SIGN IS ACCEPTABLE, MARGINAL OR UNACCEPTABLE.

THE NAME AND TELEPHONE NUMBER OF THE AGENCY, CONTRACTOR, OR SUPPLIER MAY BE SHOWN ON THE CHANNELIZING DEVICE BACK OR SUPPORT, BUT NOT ON THE DEVICE FACE. THE LETTERS AND NUMBERS SHALL BE A NON-REFLECTIVE COLOR AND NOT OVER 15 SQUARE INCHES IN TOTAL AREA.

PARTICULAR ATTENTION SHOULD BE GIVEN TO MAINTAINING THE CHANNELIZING DEVICES TO KEEP THEM CLEAN, VISIBLE, AND PROPERLY POSITIONED. DEVICES SHALL BE REPLACED THAT ARE DAMAGED AND/OR HAVE LOST A SIGNIFICANT AMOUNT OF THEIR RETROREFLECTIVITY AND EFFECTIVENESS.

REFLECTORIZED PLASTIC DRUMS



DESIGN

REFLECTORIZED PLASTIC DRUMS USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE CONSTRUCTED OF LIGHTWEIGHT, FLEXIBLE, AND DEFORMABLE MATERIALS AND BE A MINIMUM OF 36 INCHES IN HEIGHT AND HAVE A MINIMUM WIDTH OF AT LEAST A 18 INCHES, REGARDLESS OF ORIENTATION. THE PREDOMINANT COLOR OF THE DRUM SHALL BE ORANGE. METAL DRUMS SHALL NOT BE USED. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, SHALL BE CIRCUMFERENTIAL, AND SHALL DISPLAY FOUR 6 INCH WIDE BANDS OF RETROREFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLUORESCENT ORANGE-WHITE, DRUMS SHALL HAVE CLOSED TOPS THAT WILL NOT ALLOW COLLECTION OF CONSTRUCTION OR OTHER DEBRIS.

APPLICATION

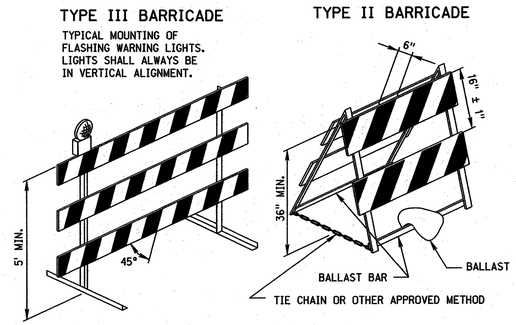
DRUMS ARE MOST COMMONLY USED TO CHANNELIZE OR DELINEATE TRAFFIC FLOW BUT MAY ALSO BE USED INDIVIDUALLY OR IN GROUPS TO MARK SPECIFIC LOCATIONS. DRUMS ARE HIGHLY VISIBLE AND HAVE GOOD TARGET VALUE; THEY GIVE THE APPEARANCE OF BEING FORMIDABLE OBSTACLES AND, THEREFORE, COMMAND THE RESPECT OF ROAD USERS.

BALLAST SHALL NOT BE PLACED ON TOP OF THE DRUM. DRUMS SHOULD NOT BE WEIGHTED WITH SAND, WATER, OR ANY MATERIAL.

BARRICADES

BARRICADE TYPE	TYPE II	TYPE III
WIDTH OF RAIL*	8 INCHES MIN. - 12 INCHES MAX.	8 INCHES MIN. - 12 INCHES MAX.
LENGTH OF RAIL	36 INCHES	8 FEET**
WIDTH OF STRIPES	6 INCHES	6 INCHES
HEIGHT	36 INCHES	5 FEET
REFLECTIVE SHEETING	TYPE IV	TYPE IV
NUMBER OF REFLECTORIZED RAIL FACES	4 (TWO EACH DIRECTION)	6 (THREE EACH DIRECTION)

*NOMINAL DIMENSIONS ARE PERMISSIBLE WHEN CONSTRUCTED FROM LUMBER.
**WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.



BALLAST SHALL NOT BE PLACED OVER ANY REFLECTIVE DEVICE

DESIGN

A BARRICADE IS A PORTABLE OR FIXED DEVICE HAVING TWO OR THREE RAILS WITH APPROPRIATE MARKINGS. IT IS USED TO CONTROL ROAD USERS BY CLOSING, RESTRICTING, OR DELINEATING ALL OR A PORTION OF THE RIGHT-OF-WAY.

BARRICADES SHALL BE ONE OF TWO TYPES; TYPE II OR TYPE III.

STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION ROAD USERS ARE TO PASS. THE STRIPES SHALL BE 6 INCHES WIDE. THE MINIMUM RAIL LENGTH FOR A TYPE II BARRICADE IS 36 INCHES.

WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, THE STRIPES SHOULD SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN. WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, THE STRIPES MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

BARRICADE RAILS SHOULD BE SUPPORTED IN A MANNER THAT WILL ALLOW THEM TO BE SEEN BY THE ROAD USER, AND IN A MANNER THAT PROVIDES A STABLE SUPPORT THAT IS NOT EASILY BLOWN OVER OR DISPLACED.

ON HIGH-SPEED ROADWAYS OR IN OTHER SITUATIONS WHERE BARRICADES MAY BE SUSCEPTIBLE TO OVERTURNING IN THE WIND, SANDBAGS SHOULD BE USED FOR BALLASTING. SANDBAGS MAY BE PLACED ON LOWER PARTS OF THE FRAME OR STAYS TO PROVIDE THE REQUIRED BALLAST BUT SHALL NOT BE PLACED ON TOP OF ANY STRIPED RAIL. BARRICADES SHALL NOT BE BALLASTED BY HEAVY OBJECTS SUCH AS ROCKS OR CHUNKS OF CONCRETE.

THE BARRICADE OWNERS NAME, NOT TO EXCEED 15 SQUARE INCHES SHALL BE SHOWN ON THE BARRICADE BACK OR SUPPORT BUT NOT ON ITS FACE.

** WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

APPLICATION

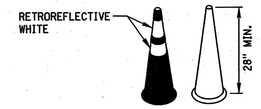
TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM, TYPE II BARRICADES SHALL NOT BE USED FOR CHANNELIZATION.

TYPE III BARRICADES USED AT A ROAD CLOSURE MAY EXTEND COMPLETELY ACROSS A ROADWAY FROM CURB TO CURB. WHERE PROVISION IS MADE FOR ACCESS OF AUTHORIZED EQUIPMENT AND VEHICLES, THE RESPONSIBILITY FOR THE TYPE III BARRICADES SHOULD BE ASSIGNED TO A PERSON WHO SHALL PROVIDE PROPER CLOSURE AT THE END OF EACH WORK DAY.

WHEN A HIGHWAY IS LEGALLY CLOSED BUT ACCESS MUST STILL BE ALLOWED FOR LOCAL TRAFFIC, THE TYPE III BARRICADES MAY NOT BE EXTENDED COMPLETELY ACROSS A ROADWAY. A SIGN WITH THE APPROPRIATE LEGEND CONCERNING PERMISSIBLE USE BY LOCAL TRAFFIC SHALL BE MOUNTED.

NORMALLY PERMANENT SIGNS MOUNTED ON BARRICADES SHALL BE ERECTED ABOVE THE BARRICADE. THE SIGNS "ROAD CLOSED", OR "ROAD WORK AHEAD", FOR EXAMPLE CAN EFFECTIVELY BE MOUNTED ABOVE THE BARRICADE THAT CLOSES THE ROADWAY. TYPE III BARRICADES SHALL BE SUPPLEMENTED WITH A LIGHTING DEVICE UNLESS SPECIFICALLY OMITTED BY THE ENGINEER. DETOUR ARROW AND LARGE WARNING ARROW SIGNS SHOULD BE PLACED ON THE FACE OF BARRICADE.

CONES



DESIGN

CONES SHALL BE PREDOMINANTLY ORANGE, FLOURESCENT RED-ORANGE, OR FLOURESCENT YELLOW/ORANGE, NOT LESS THAN 28 INCHES IN HEIGHT, AND SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING VEHICLES ON IMPACT. CONES WHEN ALLOWED ON THE INTERSTATE, FREEWAY OR EXPRESSWAY SYSTEM SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.

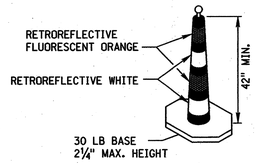
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF 2 INCHES BELOW THE 6 INCH BAND.

APPLICATION

TRAFFIC CONES ARE USED TO CHANNELIZE TRAFFIC, DIVIDE OPPOSING TRAFFIC LANES, DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION, AND DELINEATE SHORT-DURATION MAINTENANCE AND UTILITY WORK. CONES SHALL NOT BE USED FOR LANE CLOSURE TAPERS OR SHIFTS, CONES SMALLER THAN 42 INCHES SHALL NOT BE USED AT NIGHT ON RURAL HIGHWAYS, UNLESS SHOWN ON THE PLANS OR AS APPROVED OR DIRECTED BY THE ENGINEER.

STEPS SHOULD BE TAKEN TO ENSURE THAT CONES WILL NOT BE BLOWN OVER OR DISPLACED BY WIND OR MOVING TRAFFIC. CONES CAN BE DOUBLED UP TO INCREASE THEIR WEIGHT. SOME CONES ARE CONSTRUCTED WITH BASES THAT CAN BE FILLED WITH BALLAST. OTHERS HAVE SPECIAL WEIGHTED BASES, OR WEIGHTS SUCH AS SANDBAG RINGS THAT CAN BE DROPPED OVER THE CONES AND ONTO THE BASE TO PROVIDE ADDED STABILITY. BALLAST, HOWEVER, SHOULD NOT PRESENT A HAZARD IF THE CONES ARE INADVERTENTLY STRUCK.

42 INCH CONES



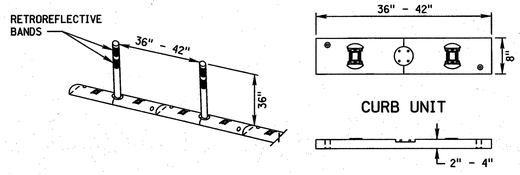
DESIGN

42 INCH CONES SHALL INCLUDE A 30 POUND RUBBER BASE AND DISPLAY FOUR 6 INCH WIDE BANDS OF RETROFEFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLOURESCENT ORANGE-WHITE.

APPLICATION

WHEN APPROVED BY THE ENGINEER OR SHOWN IN THE PLANS, 42 INCH REFLECTIVE CONES MAY BE USED IN LIEU OF TYPE II BARRICADES OR REFLECTORIZED DRUMS. 42 INCH CONES SHALL NOT BE USED FOR LANE-CLOSURE TAPERS OR SHIFTS. IF A RECTANGULAR BASE IS USED, THE LONG SIDE OF THE BASE SHOULD BE ORIENTED PARALLEL TO THE DIRECTION OF TRAFFIC.

TUBULAR POST AND CURB SYSTEM



DESIGN

TUBULAR POSTS USED IN THE SYSTEM SHALL BE 36 INCHES HIGH AND A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC. THE TUBULAR POST AND CURB SYSTEM SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES. THE COLOR SHALL BE AS SHOWN IN THE PLANS.

THE TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3-INCH WIDE RETROREFLECTIVE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. EACH CURB SECTION SHALL CONTAIN ONE RETROREFLECTIVE MARKER FACING EACH DIRECTION OF TRAFFIC. THE COLOR OF THE RETROREFLECTIVE BANDS AND MARKERS SHALL MATCH THE POST/CURB COLOR.

THE CURB SECTIONS SHALL BE CONFIGURED TO ALLOW FOR DRAINAGE FROM THE PAVEMENT SURFACE.

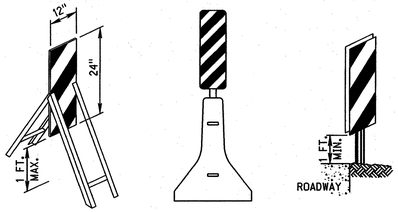
APPLICATION

TUBULAR POST AND CURB SYSTEMS MAY BE USED TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

FASTENING THE CURBS TO THE PAVEMENT WITH ANCHOR BOLTS OR OTHER SUITABLE METHODS AS DIRECTED BY THE MANUFACTURER IS REQUIRED TO MINIMIZE THE CHANCE OF BEING MOVED BY TRAFFIC.

TUBULAR POST AND CURB SYSTEMS SHALL BE INSTALLED IN THE LOCATIONS SHOWN IN THE PLANS OR DIRECTED BY THE ENGINEER.

VERTICAL PANELS



DESIGN

RETROREFLECTIVE MATERIAL ON VERTICAL PANELS SHALL BE 12 INCHES WIDE AND AT LEAST 24 INCHES HIGH. THEY SHALL HAVE ALTERNATING ORANGE AND WHITE STRIPES, WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS MORE THAN 36 INCHES, A PANEL STRIPE WIDTH OF 6 INCHES SHALL BE USED. WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS 36 INCHES OR LESS, A PANEL STRIPE WIDTH OF 4 INCHES SHALL BE USED. IF USED FOR TWO-WAY TRAFFIC, BACK-TO-BACK PANELS SHALL BE USED.

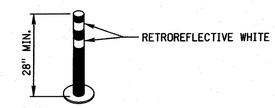
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

POST MOUNTED VERTICAL PANELS SHALL BE MOUNTED WITH THE BOTTOM A MINIMUM OF 1 FOOT ABOVE THE ROADWAY. VERTICAL PANELS ON A TEMPORARY STAND SHALL BE MOUNTED WITH THE BOTTOM A MAXIMUM OF 1 FOOT ABOVE THE ROADWAY.

APPLICATION

WHERE SPACE IS LIMITED VERTICAL PANELS MAY BE USED TO CHANNEL TRAFFIC, DIVIDE OPPOSING LANES OF TRAFFIC, DIVIDE TRAFFIC LANES OR REPLACE BARRICADES. WHEN APPROVED BY THE ENGINEER, VERTICAL PANELS MAY BE POST-MOUNTED ALONG THE SIDE OF THE ROADWAY.

TUBULAR POSTS



DESIGN

TUBULAR POSTS SHALL BE PREDOMINANTLY ORANGE, NOT LESS THAN 28 INCHES HIGH, BE A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC, AND MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES.

TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3 INCHES WIDE WHITE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP, WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. THE BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 2 INCHES.

APPLICATION

TUBULAR POSTS HAVE LESS VISIBLE AREA THAN OTHER DEVICES AND SHOULD BE USED ONLY WHERE SPACE RESTRICTIONS DO NOT ALLOW FOR THE USE OF OTHER MORE VISIBLE DEVICES. THEY MAY BE USED EFFECTIVELY TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

STEPS SHOULD BE TAKEN TO ASSURE THAT TUBULAR POSTS WILL NOT BE BLOWN OVER OR DISPLACED BY TRAFFIC BY EITHER AFFIXING THEM TO THE PAVEMENT WITH ANCHOR BOLTS OR ADHESIVE, IF A NONCYLINDRICAL DEVICE IS USED, IT SHALL BE ATTACHED TO THE PAVEMENT TO ENSURE THAT THE WIDTH FACING TRAFFIC MEETS THE MINIMUM REQUIREMENTS.

TUBULAR POSTS SHOULD NOT BE USED FOR PEDESTRIAN CHANNELIZATION OR A PEDESTRIAN BARRIERS IN TEMPORARY TRAFFIC CONTROL ZONES ON OR ALONG SIDEWALKS.

REV. NO.	DATE	DESCRIPTION OF REVISION
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
R4	JAN 95	REWRITE .

NEBRASKA DEPARTMENT OF ROADS

STANDARD PLAN NO. 920-R6

TRAFFIC CONTROL CONSTRUCTION AND MAINTENANCE

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER DANIEL J. WADDLE E-6289 STATE OF NEBRASKA

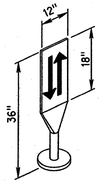
JUNE 2014
DATE

ORIGINAL:
OCTOBER 1998
DATE

1/3

ROADWAY DESIGN DIVISION
Computer: DRDESIGN55
User: dor13017
Date: 26-FEB-2014 13:21
File: 92000e06.dgn
Scale: 1:100
SHEET 2 OF 3

OPPOSING TRAFFIC LANE DIVIDERS



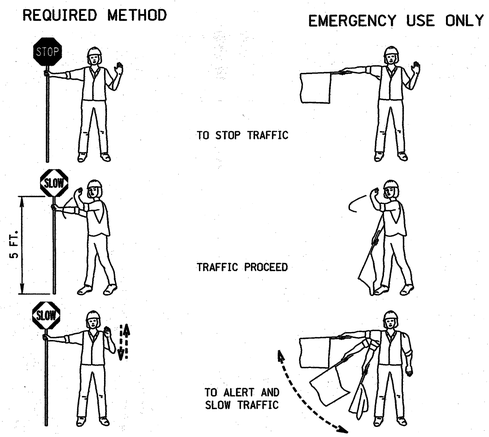
DESIGN

OPPOSING TRAFFIC LANE DIVIDERS SHALL BE A TWO SIDED UPRIGHT RETROREFLECTORIZED ORANGE PANEL, WITH A WIDTH OF 12 INCHES AND A HEIGHT OF 18 INCHES. THE TOP OF THE PANEL SHALL BE 36 INCHES ABOVE THE PAVEMENT. THE SYMBOL ON EACH SIDE SHALL BE TWO OPPOSING BLACK ARROWS. THE LANE DIVIDER SHALL BE MADE OF LIGHTWEIGHT MATERIAL THAT WILL YIELD UPON IMPACT BY A VEHICLE. THE LANE DIVIDER BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 4 INCHES. THE BASE SHALL BE ATTACHED TO THE EXISTING SURFACE BY EPOXY OR OTHER SUITABLE ADHESIVE, TO ENSURE THAT THE PANEL REMAINS FACING TRAFFIC.

APPLICATION

OPPOSING TRAFFIC LANE DIVIDERS ARE DELINEATION DEVICES USED AS CENTER LANE DIVIDERS TO SEPARATE OPPOSING TRAFFIC ON A TWO-LANE, TWO-WAY OPERATION.

FLAGGERS



FLAGGER PADDLE

THE STOP/SLOW PADDLE SHALL HAVE AN OCTAGONAL SHAPE ON A RIGID HANDLE. STOP/SLOW PADDLES SHALL BE AT LEAST 18 INCHES WIDE WITH LETTERS AT LEAST 6 INCHES HIGH. IF THE STOP/SLOW PADDLE IS PLACED ON A RIGID STAFF, THE MINIMUM LENGTH OF THE STAFF, MEASURED FROM THE BOTTOM OF THE SIGN TO THE END OF THIS STAFF THAT RESTS ON THE GROUND, SHOULD BE 5 FEET. THE STOP/SLOW PADDLE SHOULD BE THE PRIMARY AND PREFERRED HAND-SIGNALING DEVICE BECAUSE THE STOP/SLOW PADDLE GIVES ROAD USERS MORE POSITIVE GUIDANCE THAN RED FLAGS. USE OF FLAGS SHOULD BE LIMITED TO EMERGENCY SITUATIONS.

FLAGGERS

A FLAGGER MUST BE DRESSED FOR SAFETY. IN ADDITION TO THE REQUIREMENTS OF THE "WORKER VISIBILITY" SECTION LISTED BELOW, FLAGGERS SHALL WEAR:

1. AN ORANGE OR YELLOW/GREEN CAP OR HARD HAT.
2. A SHIRT WITH SLEEVES, PANTS AND SHOES (TANK TOPS, SHORTS OR SANDALS SHALL NOT BE WORN).

FLAGGERS SHALL BE INSTRUCTED IN THE PROPER LOCATION, DUTIES AND PROCEDURES FOR FLAGGING AS OUTLINED IN THE CURRENT MUTCD AND THE DEPARTMENT OF ROADS FLAGGER'S HANDBOOK. AS REQUIRED BY THE DEPARTMENT OF ROADS, THE FLAGGER SHALL BE CERTIFIED, AND HAVE IN THEIR POSSESSION, A VALID FLAGGER CERTIFICATION CARD.

WORKER VISIBILITY

ALL WORKERS WITHIN THE RIGHT-OF-WAY WHO ARE EXPOSED EITHER TO TRAFFIC (VEHICLES USING THE HIGHWAY FOR PURPOSES OF TRAVEL) OR TO CONSTRUCTION EQUIPMENT WITHIN THE WORK AREA SHALL WEAR HIGH-VISIBILITY SAFETY APPAREL. HIGH-VISIBILITY SAFETY APPAREL IS DEFINED TO MEAN PERSONAL PROTECTIVE SAFETY CLOTHING THAT;

1. IS INTENDED TO PROVIDE CONSPICUITY DURING BOTH DAYTIME AND NIGHTTIME USAGE, AND
2. MEETS THE PERFORMANCE CLASS 2 OR CLASS 3 REQUIREMENTS OF THE ANSI/ISEA 107-2004 PUBLICATION ENTITLED "AMERICAN NATIONAL STANDARDS FOR HIGH-VISIBILITY SAFETY APPAREL AND HEADWEAR"

LIGHTING DEVICES

FUNCTION

CONSTRUCTION AND MAINTENANCE ACTIVITIES OFTEN CREATE CONDITIONS ON OR NEAR THE TRAVELED WAY THAT ARE PARTICULARLY HAZARDOUS AT NIGHT. IT IS OFTEN DESIRABLE AND NECESSARY TO SUPPLEMENT THE REFLECTORIZED SIGNS, BARRIERS, AND CHANNELIZING DEVICES WITH LIGHTING DEVICES. STROBE TYPE LIGHTS ARE NOT PERMITTED.

BARRICADE WARNING LIGHTS DESIGN (BATTERY OPERATED)

TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS ARE MOST COMMONLY MOUNTED ON BARRICADES, OR WITH SIGNS AND ARE INTENDED TO WARN THE DRIVER THAT THEY ARE PROCEEDING IN A HAZARDOUS AREA. THESE LIGHTS SHALL NOT BE USED FOR DELINEATION, AS A SERIES OF FLASHING LIGHTS IN A ROW WOULD TEND TO OBSCURE THE DESIRED PATH.

TYPE "A" HIGH INTENSITY FLASHING WARNING LIGHTS ARE NORMALLY MOUNTED ON THE TYPE III BARRICADE THAT ACCOMPANIES THE ADVANCE WARNING SIGNS.

TYPE "C" STEADY BURN LIGHTS AS USED HEREIN, SHALL MEAN A SERIES OF LOW WATTAGE YELLOW ELECTRIC LIGHTS. WHERE LIGHTS ARE NEEDED TO DELINEATE OR MARK THE TRAVELED WAY THROUGH AND AROUND OBSTRUCTIONS IN A CONSTRUCTION MAINTENANCE AREA, THE DELINEATION SHALL BE ACCOMPLISHED BY USE OF STEADY BURNING LIGHTS. WHEN USED TO SUPPLEMENT CHANNELIZATION, THE MAXIMUM SPACING FOR WARNING LIGHTS SHOULD BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS. WHEN USED TO DELINEATE A CURVE, TYPE "C" WARNING LIGHTS SHOULD ONLY BE USED ON DEVICES ON THE OUTSIDE OF THE CURVE, AND NOT ON THE INSIDE OF THE CURVE.

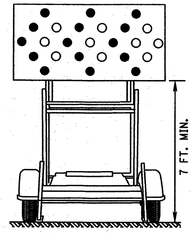
FLASHING ARROW PANEL (DISPLAY)

AN ARROW PANEL IS A SIGN WITH A MATRIX OF ELEMENTS, CAPABLE OF EITHER FLASHING OR SEQUENTIAL DISPLAYS. THIS SIGN SHALL PROVIDE ADDITIONAL WARNING AND DIRECTIONAL INFORMATION TO ASSIST IN MERGING AND CONTROLLING ROAD USERS THROUGH OR AROUND A TEMPORARY TRAFFIC CONTROL ZONE. AN ARROW PANEL SHOULD BE USED IN COMBINATION WITH APPROPRIATE SIGNS, CHANNELIZING DEVICES OR OTHER TRAFFIC CONTROL DEVICES.

DESIGN

ARROW PANELS SHALL MEET THE SIZE AND SPECIFICATIONS OF THE MUTCD FOR TYPE "C" ARROW DISPLAYS.

FLASHING ARROW PANEL SHALL BE RECTANGULAR, OF SOLID APPEARANCE AND FINISHED IN NON-REFLECTIVE BLACK. THE PANEL SHALL BE MOUNTED ON A VEHICLE, TRAILER OR OTHER SUITABLE SUPPORT. MINIMUM MOUNTING HEIGHT MEASURED VERTICALLY FROM THE BOTTOM OF THE PANEL TO THE ROADWAY BELOW IT OR TO THE ELEVATION OF THE NEAR EDGE OF THE ROADWAY. SHALL BE 7 FEET EXCEPT ON VEHICLE-MOUNTED PANELS, WHICH SHOULD BE AS HIGH AS PRACTICAL.



THE FOLLOWING SELECTIONS SHALL BE PROVIDED ON THE ARROW PANEL	
OPERATING MODE	PANEL DISPLAY
FLASHING ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL CHEVRON	RIGHT SHOWN; LEFT OPPOSITE
FLASHING DOUBLE ARROW	
FLASHING OR ALTERNATING CAUTION	FLASHING LINE OR FLASHING CORNERS OR ALTERNATING DIAMOND CAUTION

THE ARROW PANEL SHALL HAVE A MINIMUM SIZE OF 96 INCHES WIDE AND 48 INCHES HIGH. THE MINIMUM LEGIBILITY DISTANCE SHALL BE 1 MILE. THE PANEL SHALL CONTAIN 25 LAMP ELEMENTS. ARROW PANEL ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING, AUTOMATICALLY WHEN AMBIENT LIGHT FALLS BELOW 50 LUX.

THE MINIMUM ELEMENT "ON TIME" SHALL BE 50 PERCENT FOR THE FLASHING MODE AND EQUAL INTERVALS OF 25 PERCENT FOR EACH SEQUENTIAL CHEVRON PHASE. THE FLASHING RATE SHALL BE NO FEWER THAN 25 NOR MORE THAN 40 FLASHES PER MINUTE.

APPLICATION

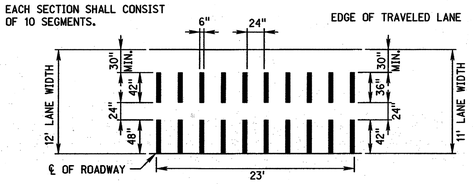
A FLASHING ARROW OR SEQUENTIAL CHEVRON MODE SHALL ONLY BE USED FOR STATIONARY OR MOVING LANE CLOSURES.

FOR SHOULDER WORK BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

AN ARROW DISPLAY MODE SHALL NOT BE USED ON A TWO-LANE TWO-WAY ROADWAY FOR TEMPORARY ONE-LANE OPERATION OR LANE SHIFTS. AN ARROW DISPLAY SHALL NOT BE USED TO LATERALLY SHIFT TRAFFIC.

TEMPORARY RUMBLE STRIPS

EACH SECTION SHALL CONSIST OF 10 SEGMENTS.



DESIGN

TEMPORARY RUMBLE STRIPS MAY BE MADE OF ASPHALT PAVING MATERIAL, EPOXY AND AGGREGATE OR OTHER SUITABLE MATERIAL WHICH WILL MAINTAIN A DESIRABLE RUMBLE EFFECT. THE TEMPORARY RUMBLE STRIP SHOULD HAVE AN INSTALLED HEIGHT OF ⅝". PREFORMED RUMBLE STRIPS MAY BE USED PROVIDED THEY HAVE A MINIMUM ½" HEIGHT.

TRAFFIC SIGNALS

TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN EQUIPMENT CROSSINGS WHERE THE VOLUME OF FILL MATERIAL AND THE NUMBER OF EQUIPMENT CROSSINGS PER HOUR IS HIGH. TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN BRIDGE CONSTRUCTION SITES WHERE A COMBINATION OF ONE-WAY TRAFFIC AND HIGH TRAFFIC VOLUMES WOULD BE BEST SERVED WITH THIS TYPE OF TRAFFIC CONTROL.

ALL TRAFFIC SIGNAL REQUESTS AND METHOD OF INSTALLATION ON THE STATE HIGHWAY SYSTEM SHALL BE IN COMPLIANCE WITH THE MUTCD AND MUST BE APPROVED BY THE STATE TRAFFIC ENGINEER.

IF, AFTER THE SIGNAL ASSEMBLIES ARE ERECTED AND THE ROAD IS OPEN TO PUBLIC TRAVEL, THE SIGNAL SYSTEM IS NOT PUT IMMEDIATELY INTO OPERATION, THE SIGNAL FACES SHALL BE COVERED WITH BURLAP OR OTHER OPAQUE MATERIAL SUBJECT TO THE APPROVAL OF THE ENGINEER. INOPERATIVE SIGNALS ON ROADS OPEN TO THE PUBLIC SHALL ALWAYS BE COVERED. TILTING THE SIGNALS UPWARD IS NOT AN ACCEPTABLE ALTERNATIVE TO COVERING THE HEADS.

FLOODLIGHTS

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHALL BE USED TO ILLUMINATE FLAGGER STATIONS. FLOODLIGHTS SHOULD BE USED TO ILLUMINATE EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHT IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTING BE PERMITTED TO CREATE A DISABLING GLARE FOR DRIVERS. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

PAVEMENT MARKING

IT IS INTENDED TO THE EXTENT POSSIBLE, THAT MOTORISTS BE PROVIDED MARKINGS WITHIN A WORK AREA COMPARABLE TO THE MARKINGS NORMALLY MAINTAINED ALONG ADJACENT ROADWAYS, PARTICULARLY AT EITHER END OF THE WORK AREA.

ALL MARKINGS AND DEVICES USED TO DELINEATE VEHICLE AND PEDESTRIAN PATHS SHALL BE CAREFULLY REVIEWED DURING DAYTIME AND NIGHTTIME PERIODS TO AVOID INADVERTENTLY LEADING DRIVERS OR PEDESTRIANS FROM THE INTENDED PATH.

PAVEMENT MARKINGS NO LONGER APPLICABLE SHALL BE REMOVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.

TAPERS

TAPERS ARE CREATED USING A SERIES OF CHANNELIZING DEVICES OR PAVEMENT MARKINGS TO MOVE TRAFFIC OUT OF OR INTO ITS NORMAL PATH.

MERGING TAPER

A MERGING TAPER REQUIRES THE LONGEST DISTANCE BECAUSE DRIVERS ARE REQUIRED TO MERGE INTO COMMON ROAD SPACE. THE TAPER SHOULD BE LONG ENOUGH TO ENABLE MERGING DRIVERS TO HAVE ADEQUATE ADVANCE WARNING AND SUFFICIENT LENGTH TO ADJUST THEIR SPEEDS AND MERGE INTO A SINGLE LANE BEFORE THE DOWNSTREAM END OF THE TRANSITION.

SHIFTING TAPER

A SHIFTING TAPER IS USED WHEN MERGING IS NOT REQUIRED, BUT A LATERAL SHIFT IS NEEDED. APPROXIMATELY ONE-HALF "L" HAS BEEN FOUND TO BE ADEQUATE. WHERE MORE SPACE IS AVAILABLE, IT MAY BE BENEFICIAL TO USE LONGER TAPERS. GUIDANCE FOR CHANGES IN ALIGNMENT MAY ALSO BE ACCOMPLISHED BY USING HORIZONTAL CURVES DESIGNED FOR NORMAL HIGHWAY SPEEDS.

SHOULDER TAPERS

A SHOULDER TAPER MAY BE BENEFICIAL ON HIGH-SPEED ROADWAYS WHERE SHOULDERS ARE PART OF THE ACTIVITY AREA AND ARE CLOSED, OR WHEN IMPROVED SHOULDERS MIGHT BE MISTAKEN AS A DRIVING LANE IN THESE INSTANCES, THE SAME TYPE, BUT ABBREVIATED, CLOSURE PROCEDURES USED ON A NORMAL PORTION OF THE ROADWAY CAN BE USED. IF USED, SHOULDER TAPERS APPROACHING THE ACTIVITY AREA SHOULD HAVE A LENGTH OF ABOUT ONE-THIRD "L".

DOWNSTREAM TAPERS

THE DOWNSTREAM TAPER MAY BE USEFUL IN TERMINATION AREAS TO PROVIDE A VISUAL CUE TO THE DRIVER THAT ACCESS IS AVAILABLE TO THE ORIGINAL LANE OR PATH THAT WAS CLOSED. WHEN USED, IT SHOULD HAVE A MINIMUM LENGTH OF ABOUT 100 FEET PER LANE, WITH DEVICES SPACED ABOUT 20 FEET APART.

ONE LANE, TWO WAY TAPER

THE ONE-LANE, TWO-WAY TAPER IS USED IN ADVANCE OF AN ACTIVITY AREA THAT OCCUPIES PART OF A TWO-WAY ROADWAY IN SUCH A WAY THAT A PORTION OF THE ROAD IS USED ALTERNATELY BY TRAFFIC IN EACH DIRECTION. A SHORT TAPER HAVING A MINIMUM LENGTH OF 50 FEET AND A MAXIMUM LENGTH OF 100 FEET WITH CHANNELZING DEVICES AT APPROXIMATELY 20 FOOT SPACINGS SHOULD BE USED TO GUIDE TRAFFIC INTO THE ONE-LANE-SECTION AND A DOWNSTREAM TAPER WITH A LENGTH OF APPROXIMATELY 100 FEET SHOULD BE USED TO GUIDE TRAFFIC BACK INTO THEIR ORIGINAL LANE.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES	
TYPE OF TAPER	TAPER LENGTH (FEET)
MERGING TAPER	L MINIMUM
SHIFTING TAPER	1/2 L MINIMUM
SHOULDER TAPER	1/3 L MINIMUM
TWO-WAY TAPER	100 FEET MAXIMUM

FORMULAS FOR L	
SPEED	FORMULA
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR GREATER	L = WS

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED LIMIT PRIOR TO WORK IN MPH

TAPER LENGTH L (FEET)			
SPEED (MPH)	LANE WIDTH		
S	10 FT.	11 FT.	12 FT.
25	105	115	125
30	150	165	180
35	205	225	245
40	270	295	320
45	450	495	540
50	500	550	600
55	550	605	660
60	600	660	720
65	650	715	780
75	750	825	900

REV. NO.	DATE	DESCRIPTION OF REVISION
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
R4	JAN 95	REWRITE

NEBRASKA DEPARTMENT OF ROADS

STANDARD PLAN NO. 920-R6

TRAFFIC CONTROL CONSTRUCTION AND MAINTENANCE

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

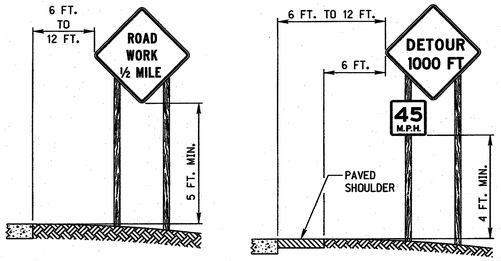
PROFESSIONAL CIVIL ENGINEER
DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

JUNE 2014
DATE

ORIGINAL:
OCTOBER 1998
DATE

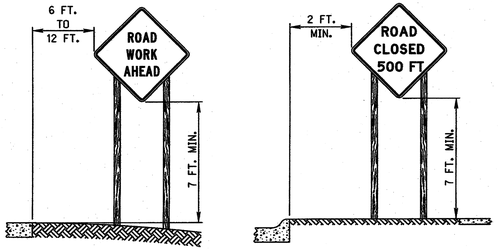
ROADSIDE SIGNS

HEIGHT AND LATERAL LOCATION OF SIGNS
RURAL AREA



WITH SPEED ADVISORY PLATE

URBAN AREA



TYPICAL FIRST SIGN AT CONSTRUCTION SITE

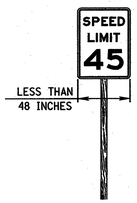
WITH TYPE "A" FLASHING WARNING LIGHT MOUNTED ABOVE TYPE III BARRICADE

PORTABLE AND TEMPORARY MOUNTING

TYPICAL SIGN MOUNTINGS

POST MOUNTED

SIGNS 48 INCHES OR WIDER REQUIRE TWO POSTS



SIGN WIDTHS LESS THAN 48 INCHES MAY BE MOUNTED WITH ONE POST

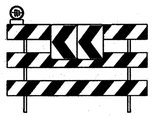
TYPICAL SIGN MOUNTINGS

OTHER THAN POST MOUNTED

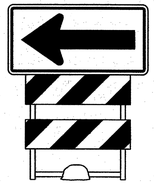
TYPE III BARRICADE WITH SIGN

PORTABLE AND TEMPORARY MOUNTING

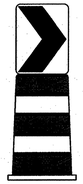
TYPE III BARRICADE WITH SIGN AND DETOUR ARROW



TYPE III BARRICADE WITH CHEVRONS



TYPE II BARRICADE WITH DETOUR ARROW OR SIGN



PLASTIC DRUM WITH CHEVRON OR SIGN

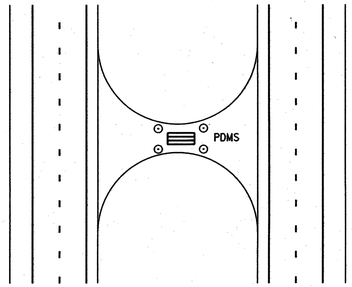
TEMPORARY SIGN SUPPORTS

ALL "TEMPORARY SIGN" SUPPORTS (BASES) SHALL BE NCHRP 350 OR MASH (TL-3) APPROVED.

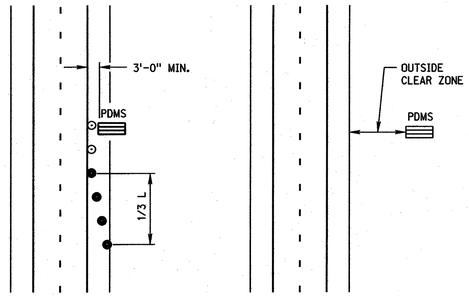
"TEMPORARY SIGNS" ARE ALL TEMPORARILY MOUNTED WORK ZONE SIGNS THAT ARE NOT POST MOUNTED IN THE GROUND AT THE TYPICAL 5 FOOT MOUNTING HEIGHT. TEMPORARY SIGNS ARE CONSIDERED NCHRP 350 OR MASH CATEGORY 2 DEVICES AND ARE MOUNTED ON TEMPORARY SIGN STANDS. TEMPORARY SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT ABOVE THE GROUND, UNLESS OTHERWISE REQUIRED TO BE MOUNTED AT A HIGHER HEIGHT.

TEMPORARY SIGNS AND THEIR SUPPORTS SHALL NOT BE IN PLACE LONGER THAN 3 DAYS. ANY SIGN THAT IS TO BE IN PLACE LONGER THAN 3 DAYS SHALL BE POST MOUNTED OR MOUNTED TO A DRUM, BARRICADE, OR BARRIER, AS REQUIRED BY THE PLANS OR SPECIFICATIONS.

PORTABLE DYNAMIC MESSAGE SIGN DELINEATION



IN MEDIAN



ON SHOULDER OFF SHOULDER

PORTABLE DYNAMIC MESSAGE SIGNS (PDMS)

THE PLACEMENT OF PDMS SHOULD BE IN THE FOLLOWING ORDER:

WHENEVER POSSIBLE, PDMS SHOULD BE PLACED OFF OF ANY USABLE PORTION OF THE ROADWAY ON THE RIGHT SIDE OF THE ROADWAY. WHEN PLACED OUTSIDE THE CLEAR ZONE OR BEHIND GUARDRAIL OR CONCRETE PROTECTION BARRIERS, DELINEATION IS NOT REQUIRED.

WHERE FIELD CONDITIONS DO NOT ALLOW FOR THIS PLACEMENT, THE SIGNS MAY BE LOCATED ON THE OUTSIDE SHOULDER OF THE ROADWAY OR WITHIN THE MEDIAN.

A. A MINIMUM CLEARANCE OF 3 FEET MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF THE TRAVELED WAY IS RECOMMENDED.
B. THE PDMS SHOULD HAVE A MINIMUM MOUNTED HEIGHT OF 7 FEET ON FREEWAYS, EXPRESSWAYS AND IN URBAN AREAS.
C. ALL OTHER RURAL APPLICATIONS SHOULD HAVE A MINIMUM HEIGHT OF 5 FEET.

THESE HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF THE PAVEMENT.

REFLECTORIZED PLASTIC DRUMS SHOULD BE USED TO DELINEATE EACH SIGN USING A 1/3 L TAPER. THESE DRUMS SHOULD BE POSITIONED ON THE UPSTREAM END OF THE SIGN TO FORM A TAPER LEADING UP TO THE TRAFFIC SIDE OF THE SIGN. FOR A SIGN LOCATED IN THE MEDIAN, THE SIGN SHOULD BE DELINEATED WITH A 42 INCH CONE ON ALL FOUR CORNERS.

WHEN DEPLOYED, THE SIGN SHALL BE SIGHTED AND ALIGNED WITH APPROACHING TRAFFIC TO ENSURE VISIBILITY OF THE MESSAGE. IF MULTIPLE SIGNS ARE USED, THE SIGNS SHOULD BE LOCATED ON THE SAME SIDE OF THE ROAD AND SEPARATED ACCORDING TO PROPER SIGN SPACING.

WHEN PRACTICAL, PDMS SHOULD NOT BE USED TO REPLACE STATIC SIGNS FOR LONG TERM USAGE (OVER 10 DAYS).

WHEN PDMS ARE TO BE DEPLOYED FOR LONG PERIODS, SUCH AS INCIDENT MANAGEMENT ROLES, CONCRETE PADS WITH APPROPRIATE TIE DOWNS SHOULD BE CONSTRUCTED FOR THEIR PLACEMENT.

PDMS NOT ACTIVELY BEING USED IN A CONSTRUCTION OR INCIDENT MANAGEMENT ROLE SHOULD BE REMOVED.

REFER TO NDOR "DMS GUIDELINES" FOR PROPER PDMS MESSAGE INFORMATION.

NOTES

1. ALL TRAFFIC CONTROL DEVICES SHALL MEET THE APPLICABLE STANDARDS AND SPECIFICATIONS PRESCRIBED IN PART 6 OF THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD)" AND THE STATE OF NEBRASKA SUPPLEMENT TO THE MUTCD. ALL TRAFFIC CONTROL DEVICES SHALL BE CRASHWORTHY AND QUALIFY AS SUCH ACCORDING TO THE TESTING AND ACCEPTANCE GUIDELINES OF THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. TRAFFIC CONTROL PLANS AND DEVICES SHOULD FOLLOW THE PRINCIPLES SET FORTH, BUT MAY DEVIATE FROM THE TYPICAL DRAWINGS TO ALLOW FOR CONDITIONS AND REQUIREMENTS OF THE PROJECT.
3. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SO AS NOT TO OBSTRUCT THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
4. THE ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE THE USE, AND APPROVE THE LOCATION OF ANY OF THE DEVICES SHOWN IN THESE PLANS.

WORK ZONE SPEED LIMIT NOTES

A. WORK ZONE SPEED LIMITS SHALL NOT BE INSTALLED WITHOUT A SPEED ZONE AUTHORIZATION COMPLETED BY THE DEPARTMENT.

B. REDUCED SPEED LIMITS SHOULD BE USED ONLY IN THE SPECIFIC PORTION OF THE WORK ZONE WHERE CONDITIONS OR RESTRICTIVE FEATURES ARE PRESENT. HOWEVER, FREQUENT CHANGES IN THE SPEED LIMIT SHOULD BE AVOIDED. THE REDUCTION OF SPEED SHOULD BE DESIGNED SO VEHICLES CAN SAFELY TRAVEL THROUGH THE WORK ZONE WITH A SPEED LIMIT REDUCTION OF NO MORE THAN 10 MPH UNLESS OTHERWISE NOTED IN THE PLANS.

C. WORK ZONE SPEED LIMITS SHOWN ARE TYPICAL APPLICATIONS ONLY AND ARE NOT TO BE ASSUMED AS THE SPEED LIMITS REQUIRED FOR THE WORK.

D. EXISTING SPEED LIMIT SIGNS SHALL BE REMOVED OR COVERED WHEN A REDUCED WORK ZONE SPEED LIMIT IS IN EFFECT IN THE SAME AREA.

E. WORK ZONE SPEED LIMIT SIGNS SHALL BE INSTALLED EVERY MILE THROUGH THE WORK AREA WHEN SPEED ZONE IS REDUCED.

F. A SPEED LIMIT SIGN ENDING THE REDUCED SPEED ZONE SHALL BE INSTALLED AT THE END OF EACH ZONE.

G. DOUBLE FINES AND REDUCED SPEED ZONE SIGNING ARE NOT REQUIRED FOR SHORT-DURATION WORK LESS THAN 12 HOURS.

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:

L = MINIMUM LENGTH OF TAPER.

S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.

W = WIDTH OF OFFSET (LANE WIDTH).

LEGEND

- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- REFLECTORIZED PLASTIC DRUM OR 42" CONE
- PORTABLE DYNAMIC MESSAGE SIGN

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ORIGINAL:
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3/3

ROADWAY DESIGN DIVISION

Computer: DRDESIGN55 User: dor13017 Date: 26-FEB-2014 13:21

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