APPENDIX 4A

Channel Excavation and Embankment Drawings

MANITOBA FLOODWAY EXPANSION AUTHORITY (MFEA)

PROJECT DEFINITION AND ENVIRONMENTAL ASSESSMENT (PDEA-2)

RED RIVER EXPANDED FLOODWAY CHANNEL

EXPANDED FLOODWAY CHANNEL PRE-DESIGN - EXCAVATION AND EMBANKMENTS

LIST OF DRAWINGS:

DWG. NO.	DWG TITLE
FE-PDEA-2-251G-CS.c	COVER SHEET LIST OF DRAWINGS
FE-PDEA-2-251G-001.c	SITE PLAN AND DRAWING INDEX
FE-PDEA-2-251G-002.c	CHANNEL GENERAL ARRANGEMENT PLAN AND TYPICAL SECTIONS SHEET 1 OF 3 SHEET 2 OF 3 SHEET 3 OF 3
FE-PDEA-2-251G-003.c	STRATIGRAPHIC PROFILE ALONG CHANNEL
FE-PDEA-2-251G-004.c	CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 1 OF 19 (STA. 0+000 TO 5+757) SHEET 2 OF 19 (STA. 5+757 TO 8+555) SHEET 3 OF 19 (STA. 8+555 TO 10+756) SHEET 4 OF 19 (STA. 10+756 TO 13+368) SHEET 5 OF 19 (STA. 13+368 TO 15+554) SHEET 6 OF 19 (STA. 15+554 TO 18+249) SHEET 7 OF 19 (STA. 18+249 TO 20+053) SHEET 8 OF 19 (STA. 20+053 TO 22+536) SHEET 9 OF 19 (STA. 22+536 TO 25+019) SHEET 10 OF 19 (STA. 25+019 TO 27+511) SHEET 11 OF 19 (STA. 27+511 TO 30+162) SHEET 12 OF 19 (STA. 30+162 TO 32+814) SHEET 13 OF 19 (STA. 32+814 TO 35+380) SHEET 14 OF 19 (STA. 35+380 TO 37+864) SHEET 15 OF 19 (STA. 37+864 TO 40+964) SHEET 16 OF 19 (STA. 40+964 TO 44+104) SHEET 17 OF 19 (STA. 44+104 TO 46+753) SHEET 18 OF 19 (STA. 46+753 TO 49+249) SHEET 19 OF 19 (STA. 49+249 TO 50+598)
FE-PDEA-2-251G-005.c	CHANNEL CROSS SECTIONS 1 – 17 SHEET 1 OF 6 SHEET 2 OF 6 SHEET 3 OF 6 SHEET 4 OF 6 SHEET 5 OF 6 SHEET 6 OF 6
FE-PDEA-2-251G-007.c	CHANNEL EMBANKMENTS–AVAILABLE/UTILIZED MATERIAL VOLUMES SHEET 1 OF 3 SHEET 2 OF 3 SHEET 3 OF 3
FE-PDEA-2-251G-008.c	MASS HAUL DIAGRAM
FE-PDEA-2-251G-009.c	LOW FLOW CHANNEL UPGRADING–PROFILE AND SECTIONS

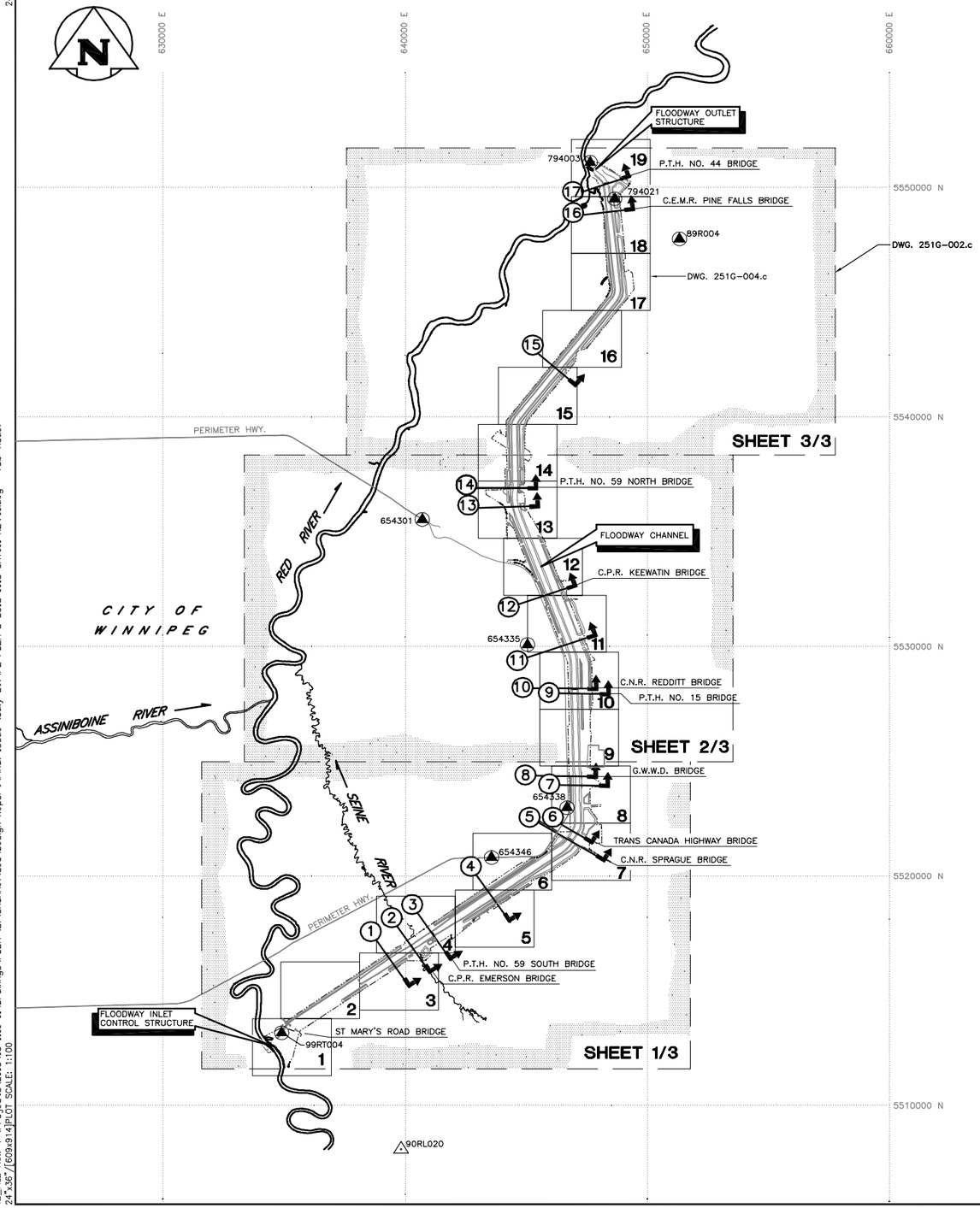
PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

KGS • ACRES • UMA

COVER SHEET
LIST OF DRAWINGS
(JULY 29, 2004)

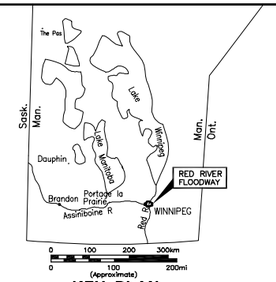
KGS FILE NO.: P:\PROJECTS\2003\03-1100-01\DRAWINGS\PDEA_(2)\CHANNEL\GEO\DESIGN_REPORT/FINAL-ISSUE-JUNE30)\FE-PDEA-2-251G-CS-SHT001-REV00.DWG
24"x36"/PLOT SCALE:

24x36B



REFERENCE GEODETIC MONUMENTS			
STATION	NORTHING	EASTING	ELEVATION (m)
87RL752	5507263.586	601240.974	238.668
* 90RL020	5508089.656	639837.157	233.461
98R207	5509536.998	680022.630	273.552
84R204	5547562.083	679113.581	242.091
654002	5515775.040	620709.870	237.302
74RCB5	5560358.200	625320.570	237.936
89R001	5523536.010	609386.640	239.483
89R002	5566804.360	619650.260	253.094
89R003	5567118.560	632662.320	232.561
* 89R004	5547754.680	651327.050	233.038
* 794021	5549501.033	648657.342	238.400
* 794003	5551091.249	647645.044	236.488
* 654301	5535527.917	640713.947	232.155
* 654335	5530075.262	645054.242	234.836
* 654338	5522972.408	646686.432	236.066
* 654346	5520805.228	643571.892	235.375
* 99RT004	5513162.350	634909.521	238.112

ALL MONUMENTS ARE NAD83 DATUM IN ZONE 14.
* MONUMENT SHOWN ON PLAN



KEY PLAN

LEGEND:

89R004 — GEODETIC BENCHMARK

10 — TYPICAL CHANNEL DESIGN SECTION (SEE DWG. 005, SHEETS 1 TO 6)

NOTES:

1. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 2 4 6 8 10km

SCALE: 1:100,000 METRIC 24"x36"
1:200,000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-001-SHT 1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
H.D.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	R.Ke.	FEBRUARY, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

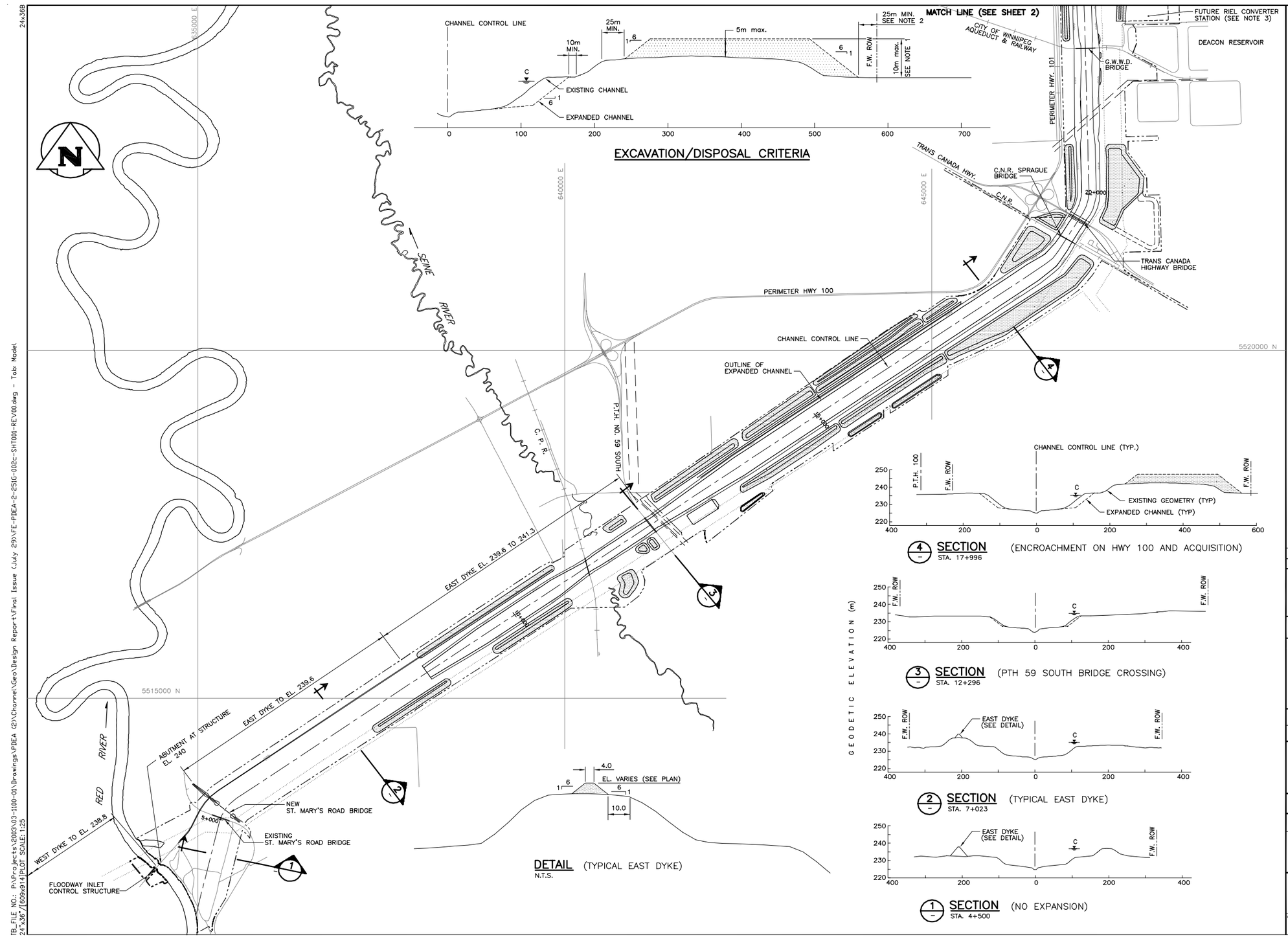
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
SITE PLAN AND DRAWING INDEX

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-001.c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-001c-SHT001-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:100



LEGEND

FLOOD LEVEL
$\pm^{C}$ 700 YEAR FLOOD LEVEL
F.W. ROW FLOODWAY RIGHT OF WAY
NEW EMBANKMENT FOR EXPANDED FLOODWAY
EXISTING HYDRO EASEMENT
FUTURE HYDRO EASEMENT
45+000 CHAINAGE ALONG CHANNEL CONTROL LINE (m)

NOTES

1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND SIDE SLOPES.
2. PLACEMENT BUFFERS MAY BE LESS THAN 25m WHERE DRAINAGE DITCH IS NOT REQUIRED.
3. FILL PLACEMENT AT THE FUTURE RIEL CONVERTER STATION IS SUBJECT TO DISCUSSIONS WITH MANITOBA HYDRO.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m
SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-002-SHT 1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.W.C.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

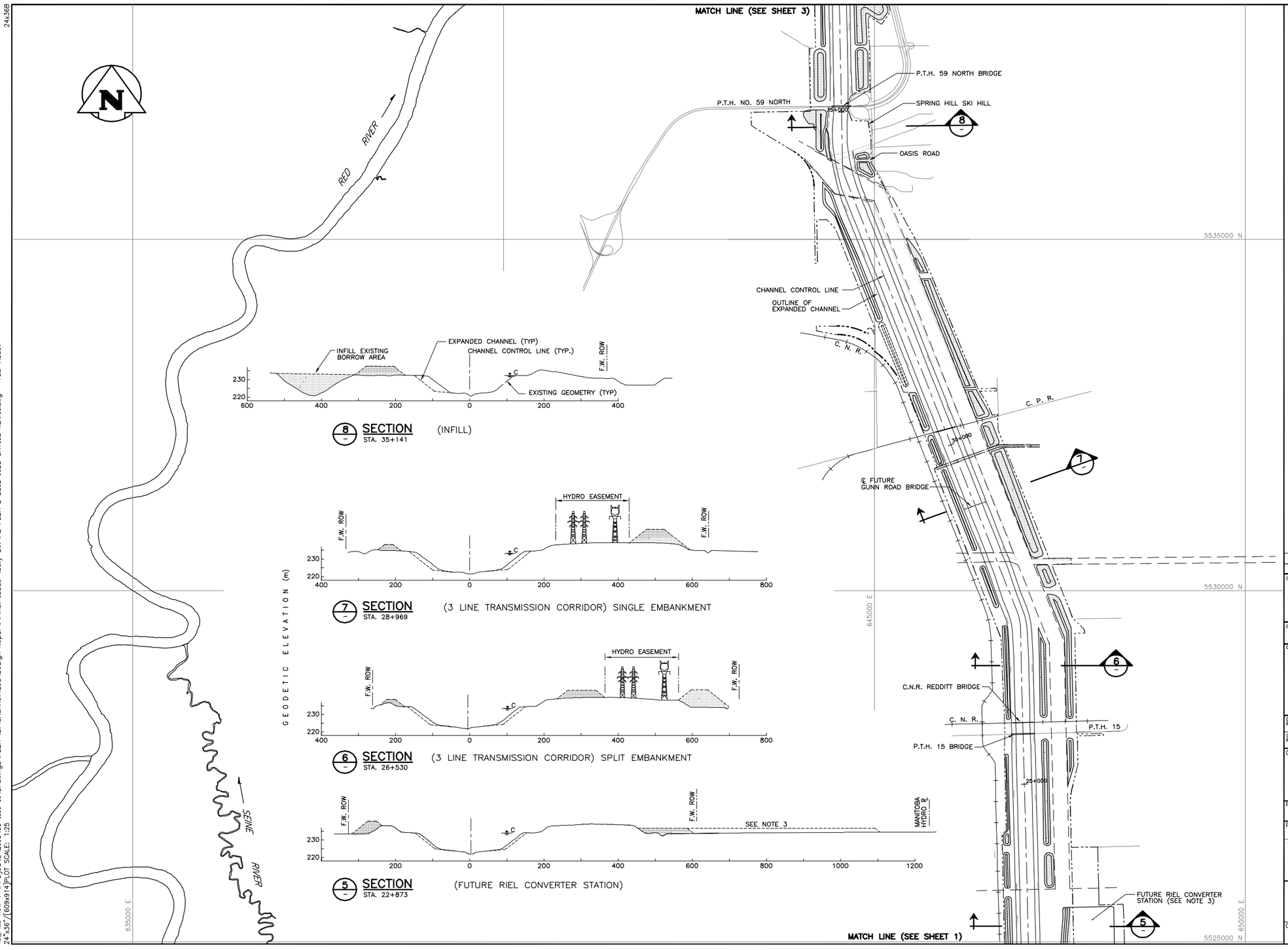
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL GENERAL ARRANGEMENT PLAN AND TYPICAL SECTIONS SHEET 1 OF 3

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-002.c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-002c-SHT001-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:25



LEGEND

FLOOD LEVEL
- 700 YEAR FLOOD LEVEL
- F.W. ROW — FLOODWAY RIGHT OF WAY
- NEW EMBANKMENT FOR EXPANDED FLOODWAY
- EXISTING HYDRO EASEMENT
- FUTURE HYDRO EASEMENT
- 45+000 — CHAINAGE ALONG CHANNEL CONTROL LINE (m)

NOTES
1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND SIDE SLOPES.
2. PLACEMENT BUFFERS MAY BE LESS THAN 25m WHERE DRAINAE DITCH IS NOT REQUIRED.
3. FILL PLACEMENT AT THE FUTURE RIEL CONVERTER STATION IS SUBJECT TO DISCUSSIONS WITH MANITOBA HYDRO.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m
SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-002-SHT 2

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.W.C.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

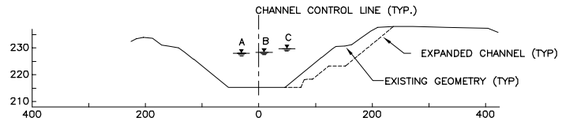
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL GENERAL ARRANGEMENT PLAN AND TYPICAL SECTIONS SHEET 2 OF 3

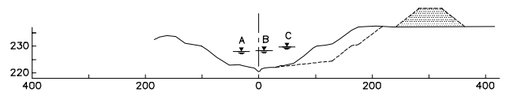
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-002c	002	00

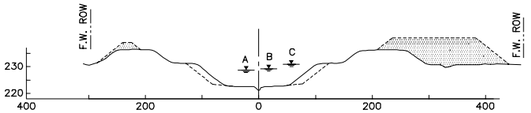
TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-002c-SHT002-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:25



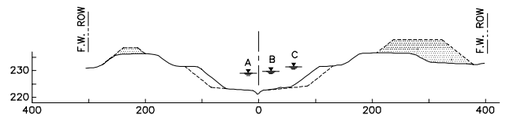
12 SECTION (OUTLET CHANNEL)
STA. 50+800



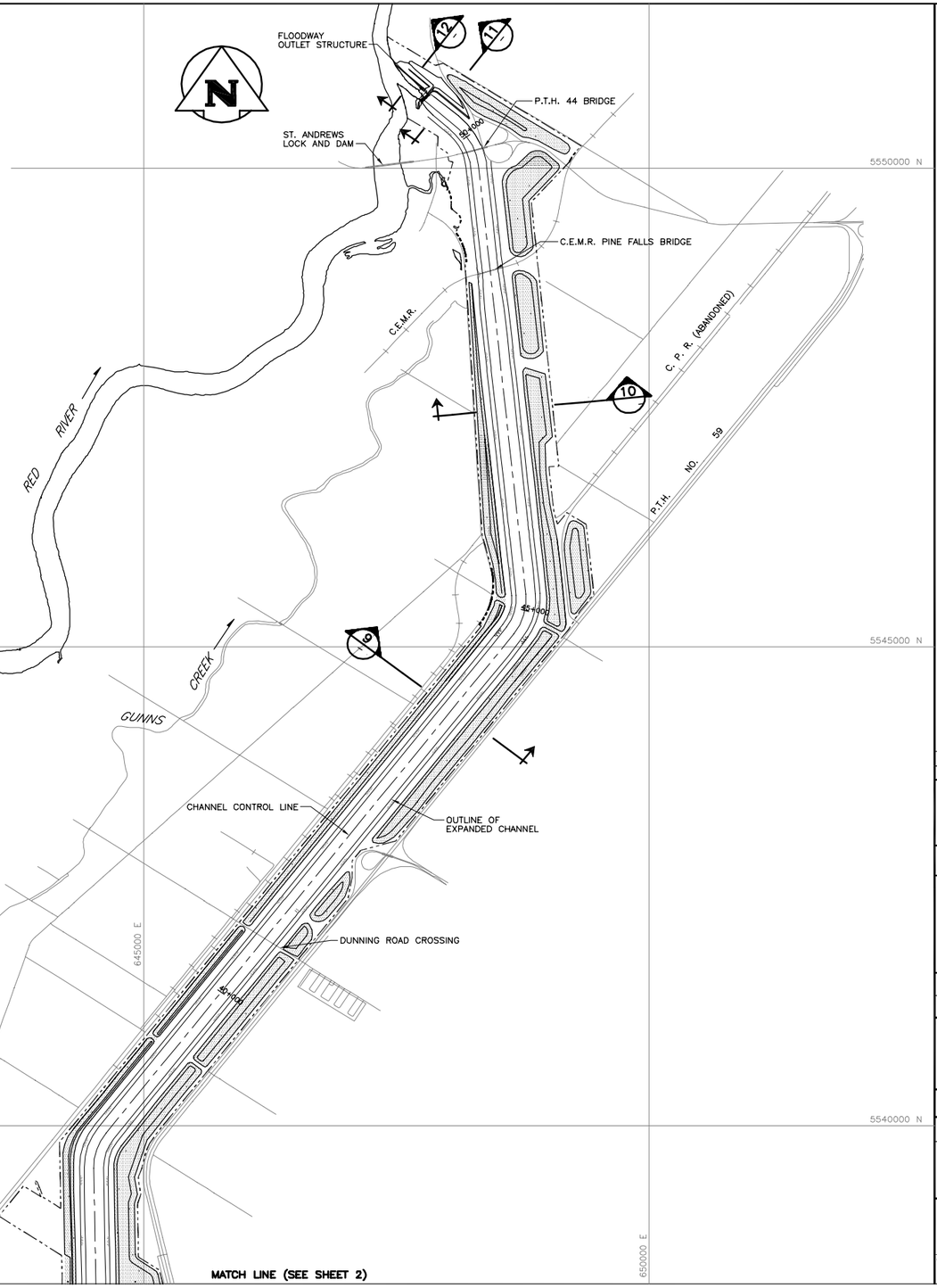
11 SECTION (EAST EXPANSION ONLY)
AT OUTLET STRUCTURE



10 SECTION (DISPOSAL PRIMARILY EAST)
STA. 46+952



9 SECTION (DISPOSAL WEST AND EAST)
STA. 43+599



LEGEND

FLOOD LEVEL
700 YEAR FLOOD LEVEL
F.W. ROW FLOODWAY RIGHT OF WAY
NEW EMBANKMENT FOR EXPANDED FLOODWAY
EXISTING HYDRO EASEMENT
FUTURE HYDRO EASEMENT
45+000 CHAINAGE ALONG CHANNEL CONTROL LINE (m)

NOTES
1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND SIDE SLOPES.
2. PLACEMENT BUFFERS MAY BE LESS THAN 25m WHERE DRAINAE DITCH IS NOT REQUIRED.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m
SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-002-SHT 3

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.W.C.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

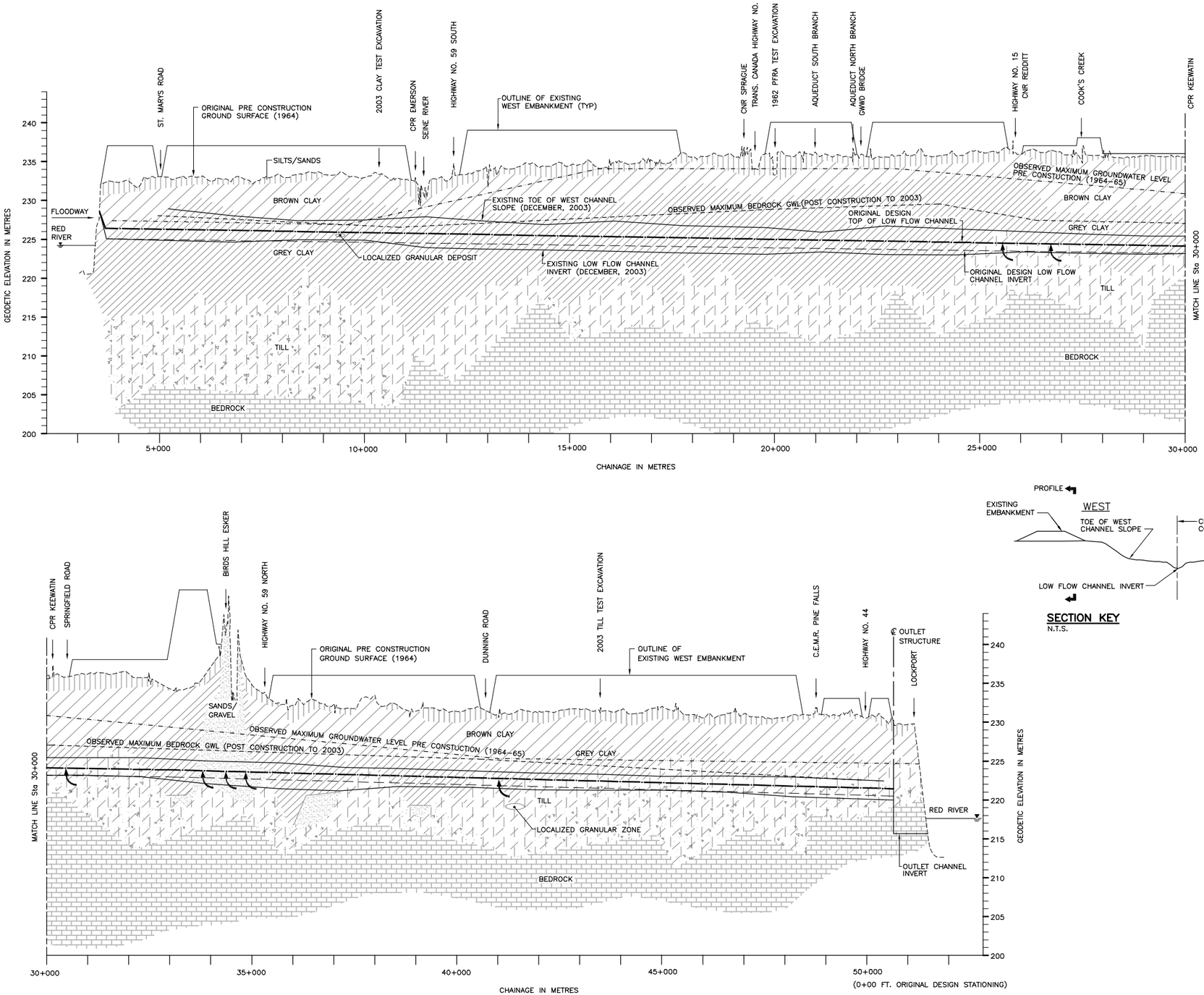
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL GENERAL ARRANGEMENT
PLAN AND TYPICAL SECTIONS
SHEET 3 OF 3

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-002c	003	00

24x36B
TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-002c-SHT003-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:25



SECTION KEY
N.T.S.

LEGEND

- GROUND SURFACE (AS PER NOTE 1)
- EXISTING TOE OF WEST CHANNEL SLOPE (DECEMBER 2003)
- EXISTING (DECEMBER 2003) LOW FLOW CHANNEL INVERT
- ORIGINAL DESIGN TOP OF LOW FLOW CHANNEL
- ORIGINAL DESIGN LOW FLOW CHANNEL INVERT
- OBSERVED MAXIMUM GROUNDWATER LEVEL PRE CONSTRUCTION (1964-65)
- OBSERVED MAXIMUM GROUNDWATER LEVEL (FOR INTERVAL BETWEEN POST CONSTRUCTION AND 2003).
- APPROXIMATE AREAS WHERE GROUNDWATER DISCHARGE (100 GPM OR GREATER) WAS NOTED DURING ORIGINAL FLOODWAY CONSTRUCTION (RENDER,1970)

NOTES:

1. DATA USED TO COMPILE SECTION INCLUDES:
   - HOBSON (1964) HAMMER SEISMIC SURVEY
   - GWDRILL DATABASE
   - MANITOBA WATER RESOURCES WELL DATABASE
   - MANITOBA DEPARTMENT OF AGRICULTURE AND CONSERVATION WATER CONTROL AND CONSERVATION BRANCH DRAWING FILE NUMBERS 11-5-1067,11-5-1137,11-5-1516,11-5-1267.
   - ACRES MANITOBA LTD. (2003)
   - KGS GROUP INC. (2003)
   - UMA ENGINEERING LTD. (2003)
   - WARDROP ENGINEERING INC. (2003)
2. BOREHOLES AND BEDROCK WELLS USED TO PRODUCE SECTION ARE LOCATED WITHIN 100m OF FLOODWAY CONTROL LINE.
3. PROFILE OF TOP OF WEST LOW FLOW CHANNEL AND LOW FLOW CHANNEL INVERT BASED ON KGS GROUP SURVEY USING GPS SYSTEM IN DECEMBER 2003 AND LABELED AS "EXISTING".

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 1000 2000 3000 4000 5000m
SCALE: 1:50000 METRIC 24"x36"
1:100000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-003-SHT 1

C of A
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
J.M./M.F.H.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

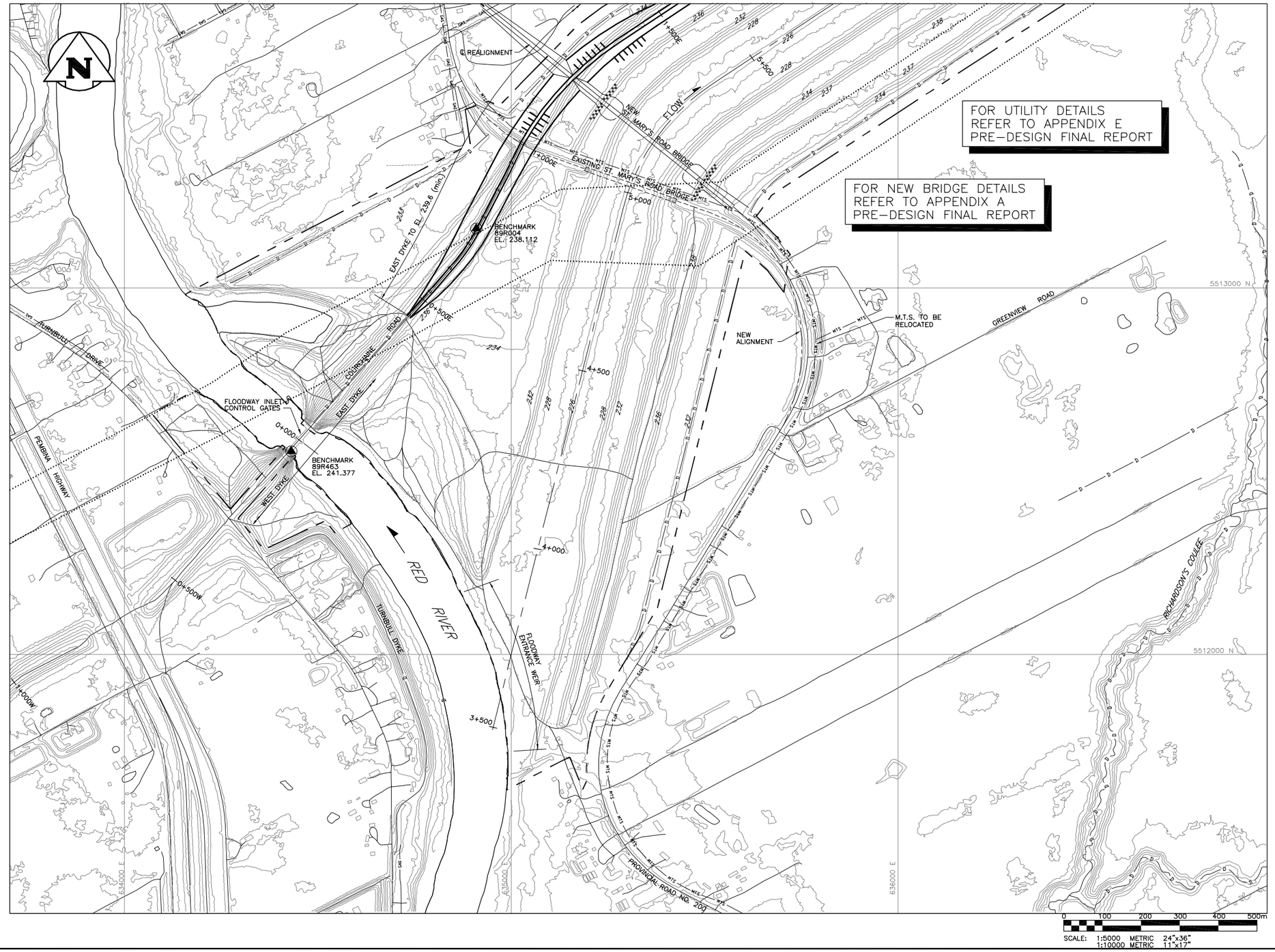
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

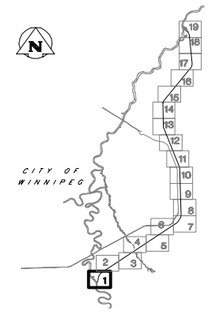
TITLE:
STRATIGRAPHIC PROFILE ALONG CHANNEL

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-003.c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-003c-SHT001-REV00.dwg - Tab: Model
24"x36"/(1609x914)PLOT SCALE:50





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

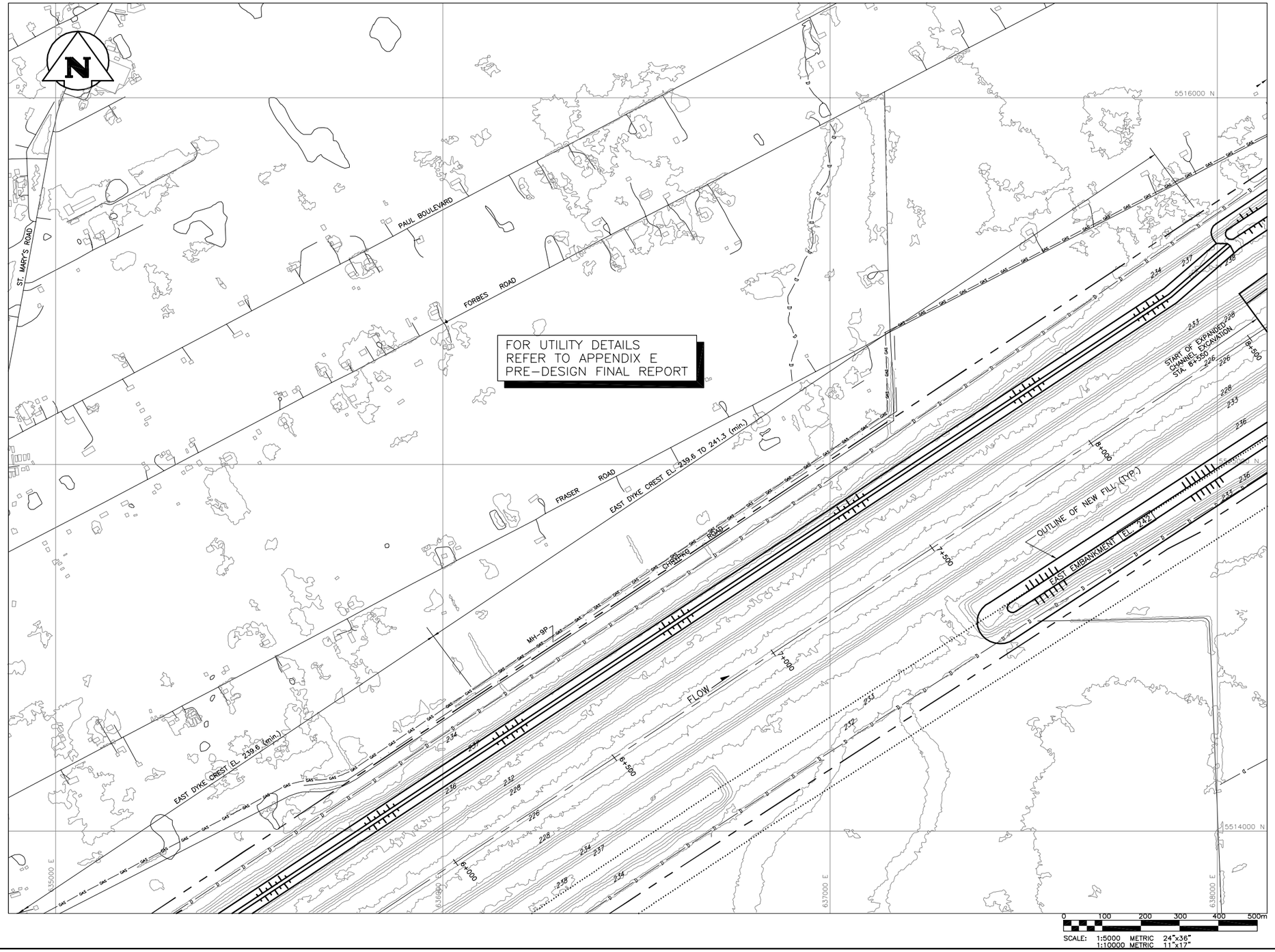
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 1 OF 19 (STA. 0+000 TO 5+757)

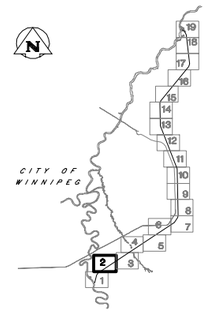
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT001-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:5

24x36B





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 2

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	FEBRUARY, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

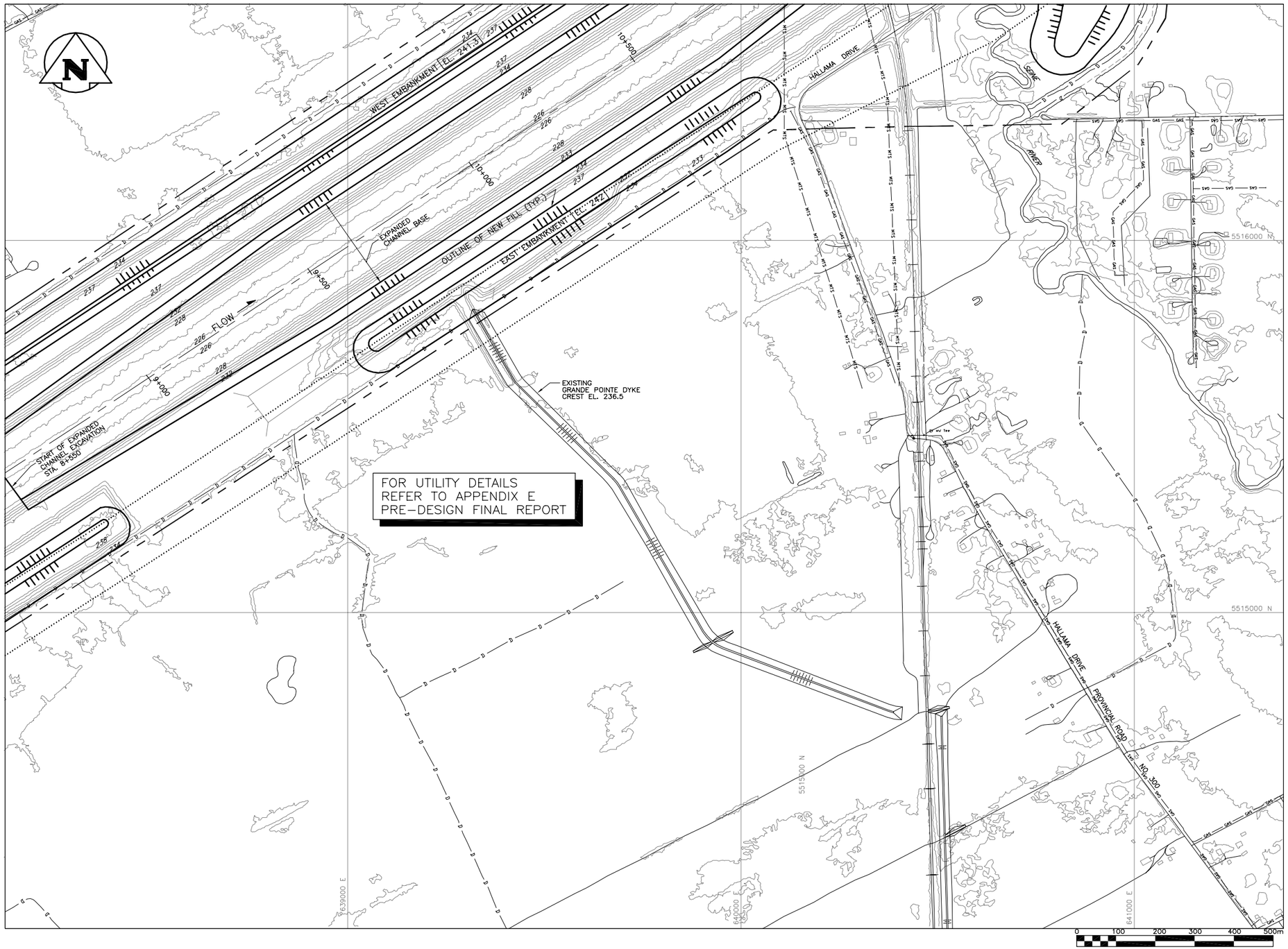
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

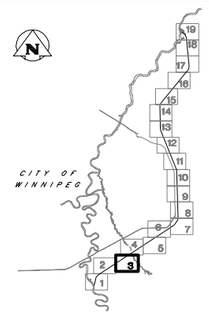
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 2 OF 19 (STA. 5+757 TO 8+555)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	002	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT002-REV00.dwg - Tab Model
24"x36"/(609x914)PLOT SCALE:1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 3

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

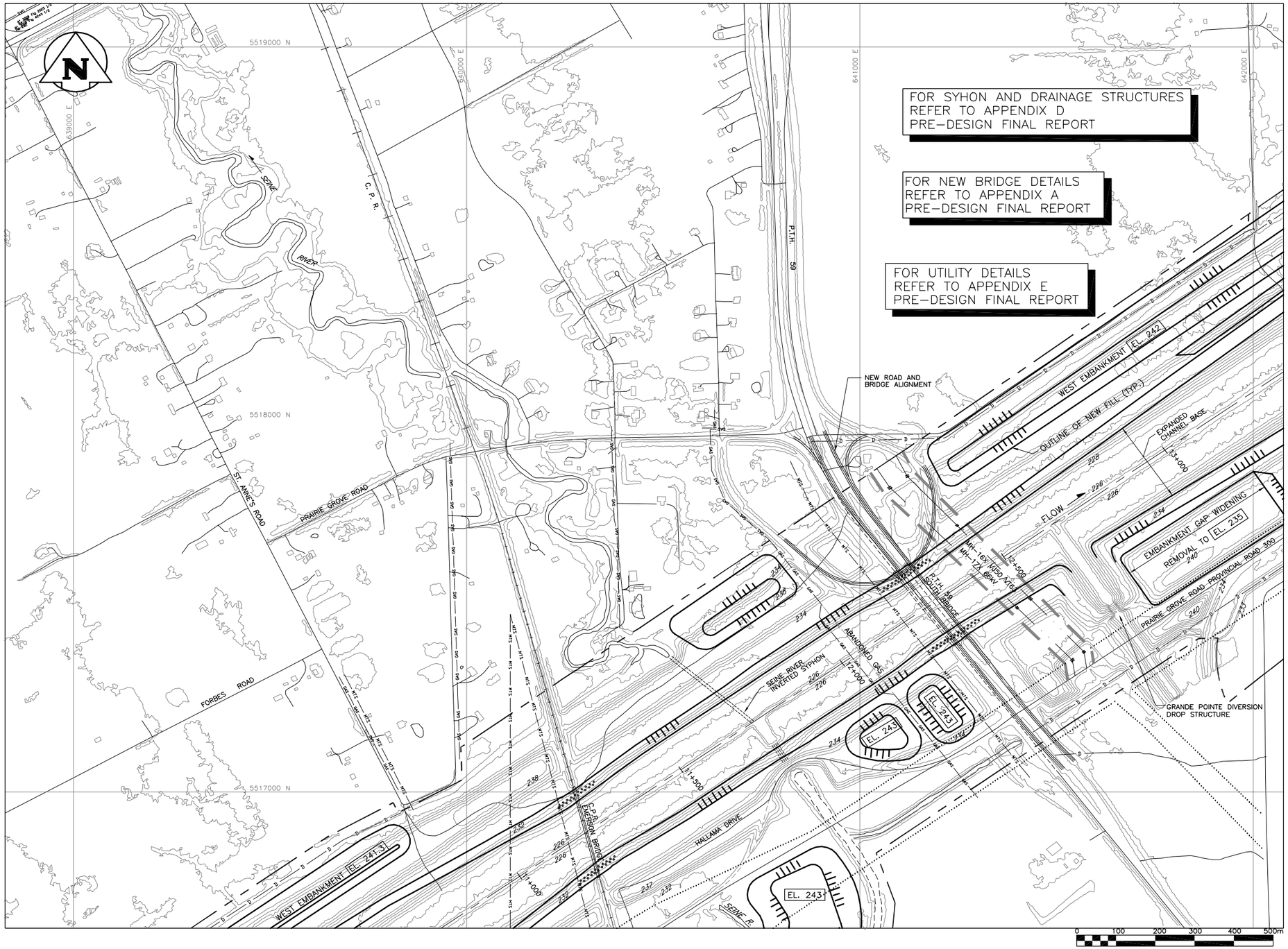
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 3 OF 19 (STA. 8+555 TO 10+756)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	003	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT003-REV00.dwg - Tab: Model
24"x36"/[609x914]PLOT SCALE:1:5

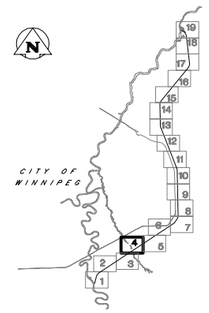
24x36B



FOR SYHON AND DRAINAGE STRUCTURES
REFER TO APPENDIX D
PRE-DESIGN FINAL REPORT

FOR NEW BRIDGE DETAILS
REFER TO APPENDIX A
PRE-DESIGN FINAL REPORT

FOR UTILITY DETAILS
REFER TO APPENDIX E
PRE-DESIGN FINAL REPORT



LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- NTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 4

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	D.B./M.R.J.	DRAWN BY:	W.G.	SCALE:	AS NOTED
CHECKED BY:	R.Ke.	APPROVED BY:	J.B.S.	DATE:	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

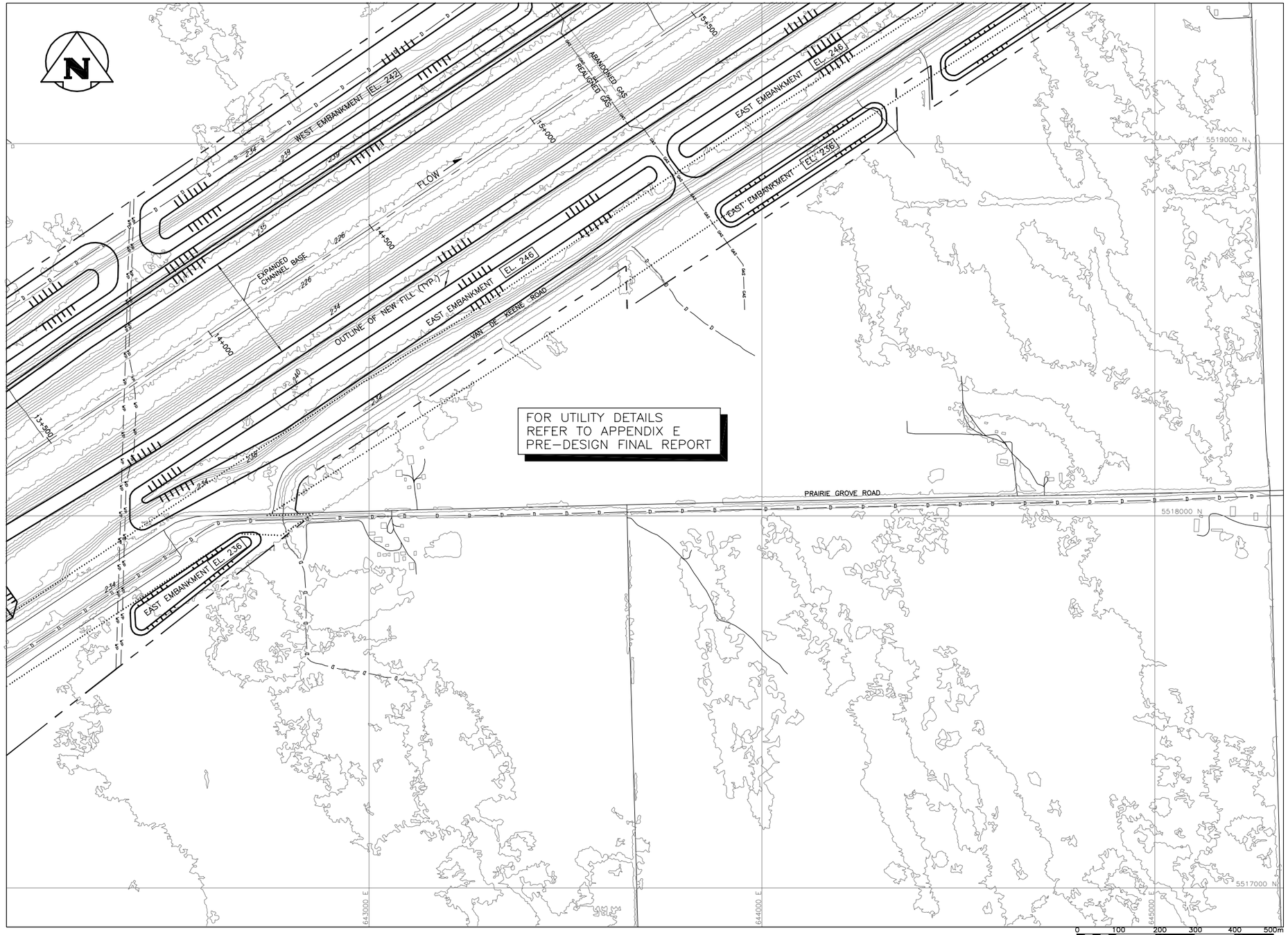
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

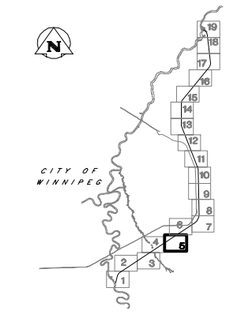
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 4 OF 19 (STA. 10+756 TO 13+368)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	004	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT004-REV00.dwg - Tab: Model
24"x36"/1609x914|PLOT SCALE: 1:5





LEGEND:

- GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS MANITOBA TELECOM SERVICES BURIED CABLE
- GAS GAS MAIN
- D DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 5

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

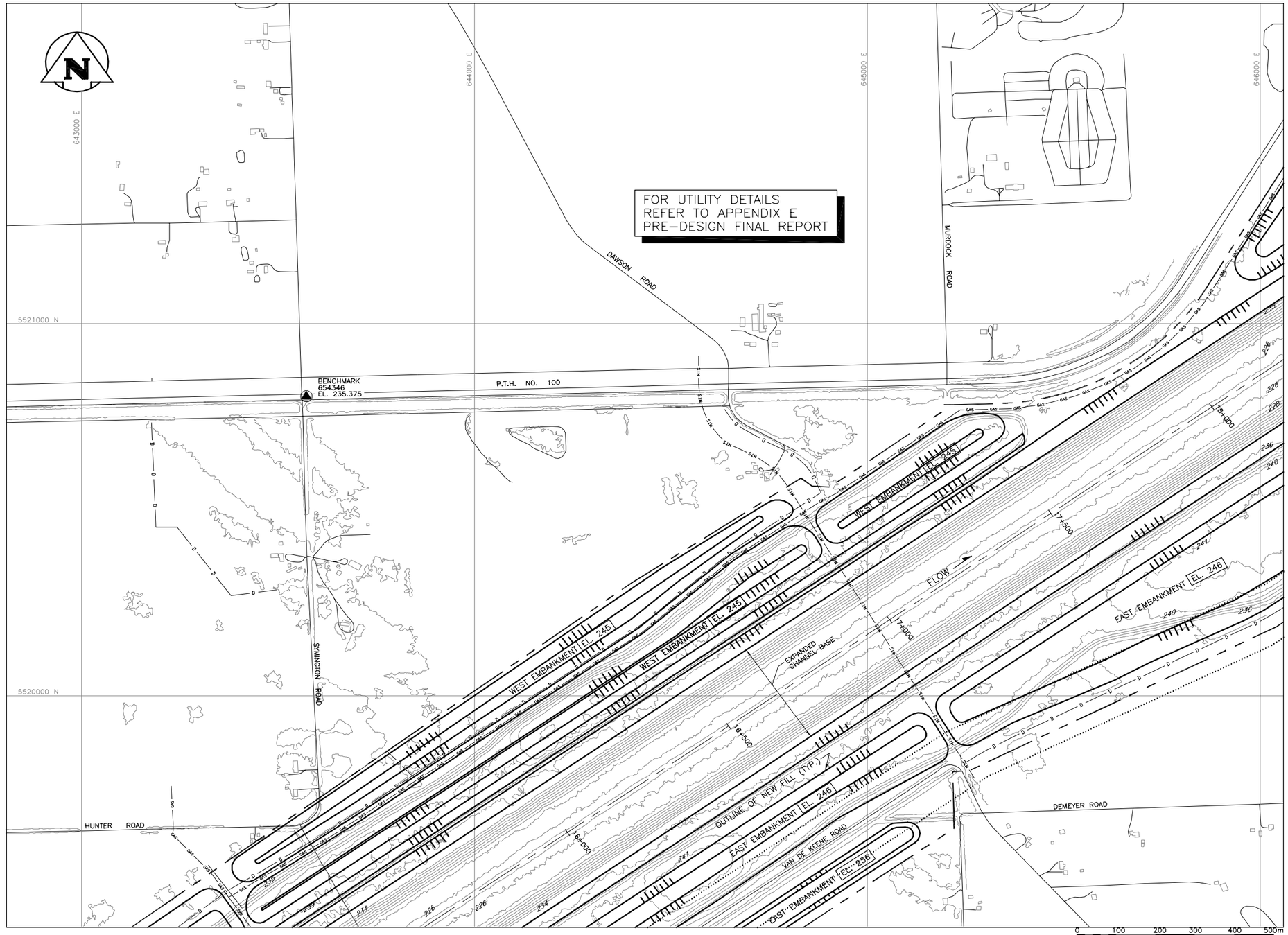
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 5 OF 19 (STA. 13+368 TO 15+554)

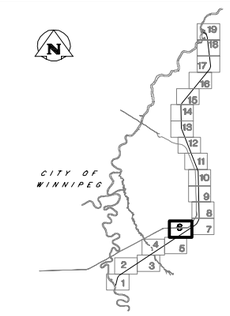
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	005	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT005-REV00.dwg - Tab Model
24"x36"/(609x914)PLOT SCALE: 1:5

24x36B





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.: 03-1100-02-004-SHT 6

C of A: APEGM Certificate of Authorization, KGS Group, No. 245 Expiry: April 30, 2005

ENG. STAMP: THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED BY J.B. SMITH ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT: RED RIVER FLOODWAY EXPANSION

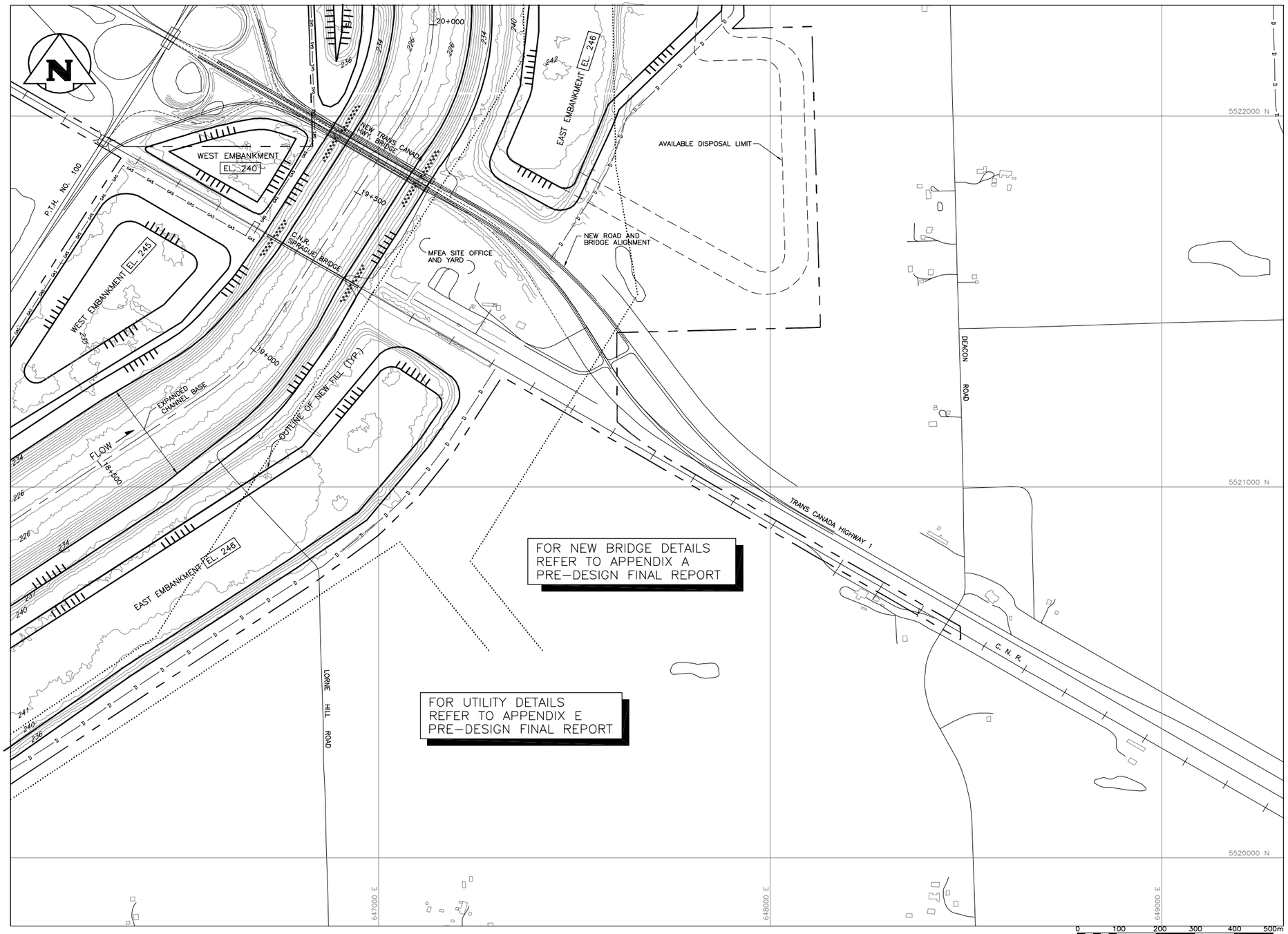
PHASE: PDEA-2 – CHANNEL – PRE-DESIGN

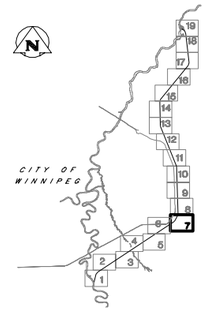
TITLE: CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 6 OF 19 (STA. 15+554 TO 18+222)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	006	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT006-REV00.dwg - Tab Model
24"x36"/(609x914)PLOT SCALE: 1:5





LEGEND:

- GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS MANITOBA TELECOM SERVICES BURIED CABLE
- GAS GAS MAIN
- D DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 7

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

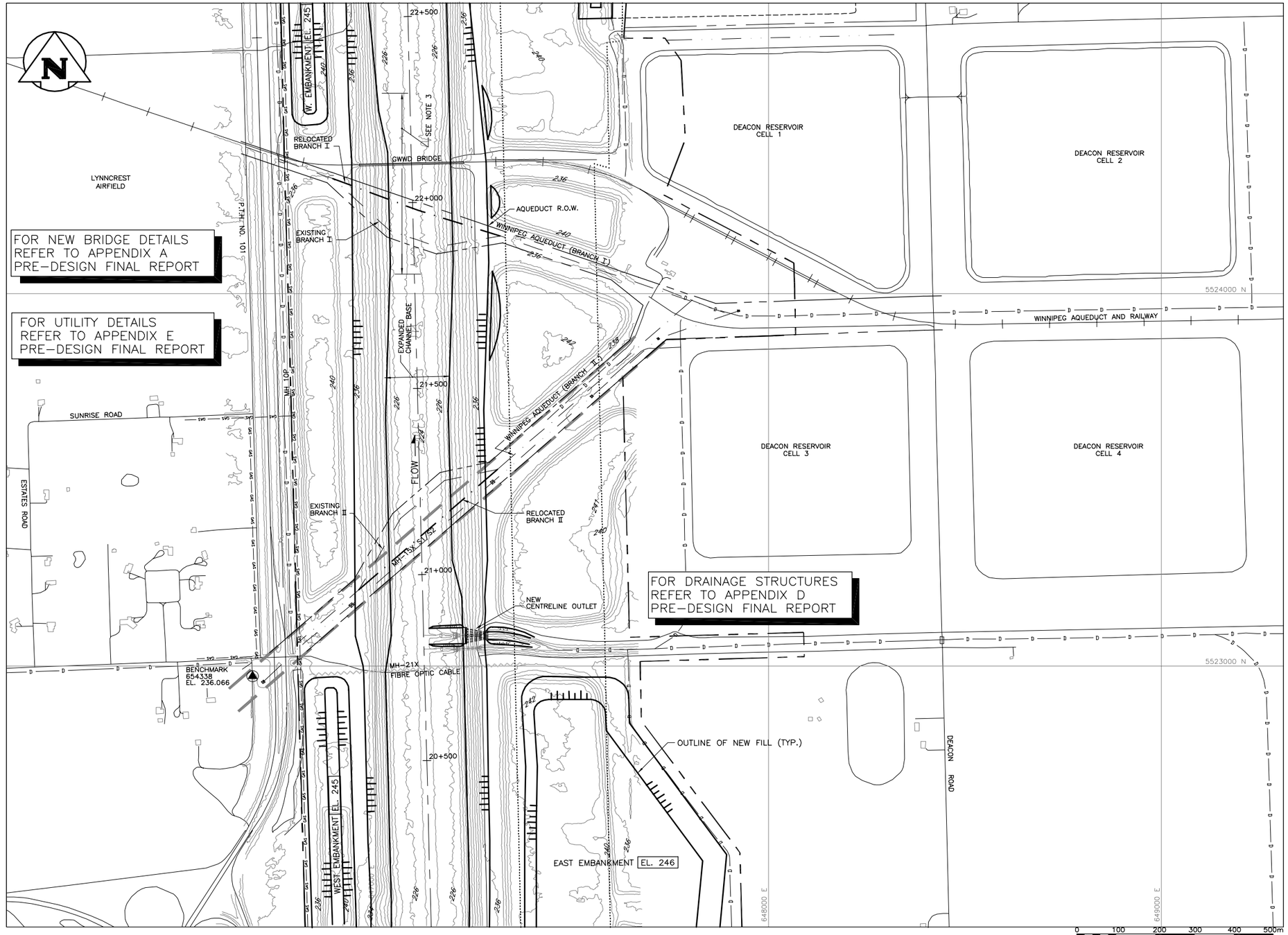
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

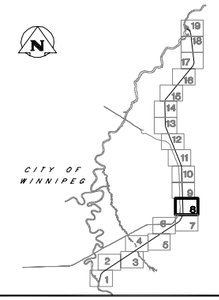
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 7 OF 19 (STA. 18+222 TO 20+053)

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	007	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT007-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. WEST CHANNEL SIDE SLOPE INDICATED WILL NOT BE MODIFIED AND WILL REMAIN IN EXISTING CONDITION.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 8

C of A
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

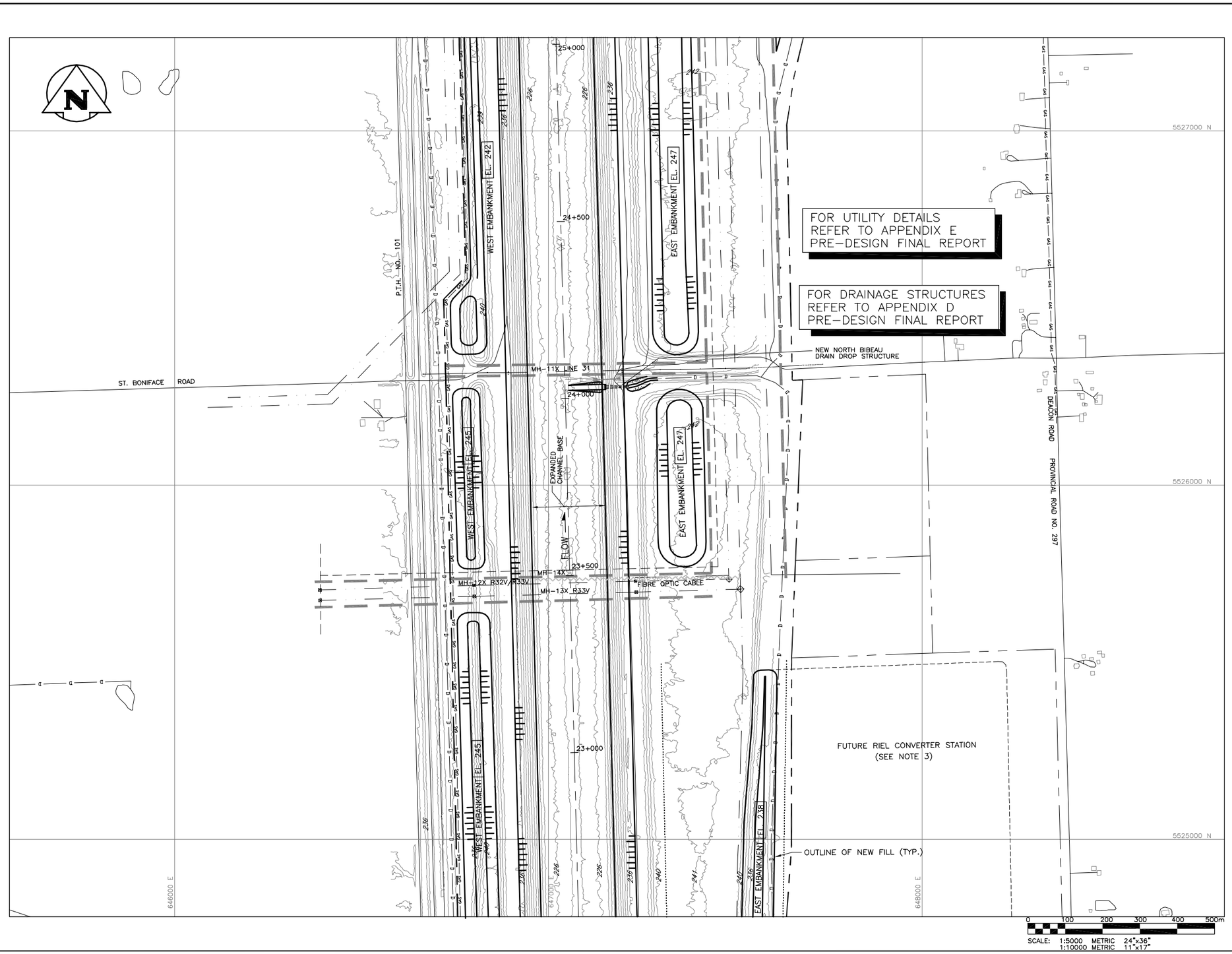
PROJECT:
RED RIVER FLOODWAY EXPANSION

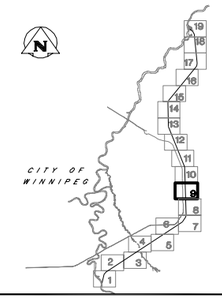
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 8 OF 19 (STA. 20+053 TO 22+536)

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	008	00





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. FILL PLACEMENT IN THE FUTURE RIEL CONVERTER STATION IS SUBJECT TO DISCUSSIONS WITH MANITOBA HYDRO.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 9

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 9 OF 19 (STA. 22+536 TO 25+019)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	009	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT009-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:5

24x36B

NEW KILDARE TRUNK TRANSCONA STORM SEWER OUTLET DROP STRUCTURE

KILDARE AVENUE

FOR DRAINAGE STRUCTURES REFER TO APPENDIX D PRE-DESIGN FINAL REPORT

FOR UTILITY DETAILS REFER TO APPENDIX E PRE-DESIGN FINAL REPORT

FOR NEW BRIDGE DETAILS REFER TO APPENDIX A PRE-DESIGN FINAL REPORT

27+500

27+000

26+500

26+000

25+500

SEE NOTE 3

EXPANDED CHANNEL BASE

FLOW

WEST EMBANKMENT EL. 241

EAST EMBANKMENT EL. 246

EAST EMBANKMENT EL. 244

EAST EMBANKMENT EL. 247

WEST EMBANKMENT EL. 242

OUTLINE OF NEW FILL (TYP.)

COOK'S CREEK DIVERSION

DEACON ROAD PROVINCIAL ROAD NO. 207

RAVENHURST ROAD

C.N.R. REDDITT BRIDGE

ABANDONED GAS

REALIGNED GAS

P.T.H. 15 BRIDGE

NEW ROAD AND BRIDGE ALIGNMENT

5529000 N

5528000 N

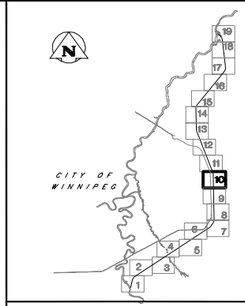
646000 E

647000 E

648000 E

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"



LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. EAST CHANNEL SIDE SLOPE WILL NOT BE MODIFIED AND REMAIN IN EXISTING CONDITION.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 10

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

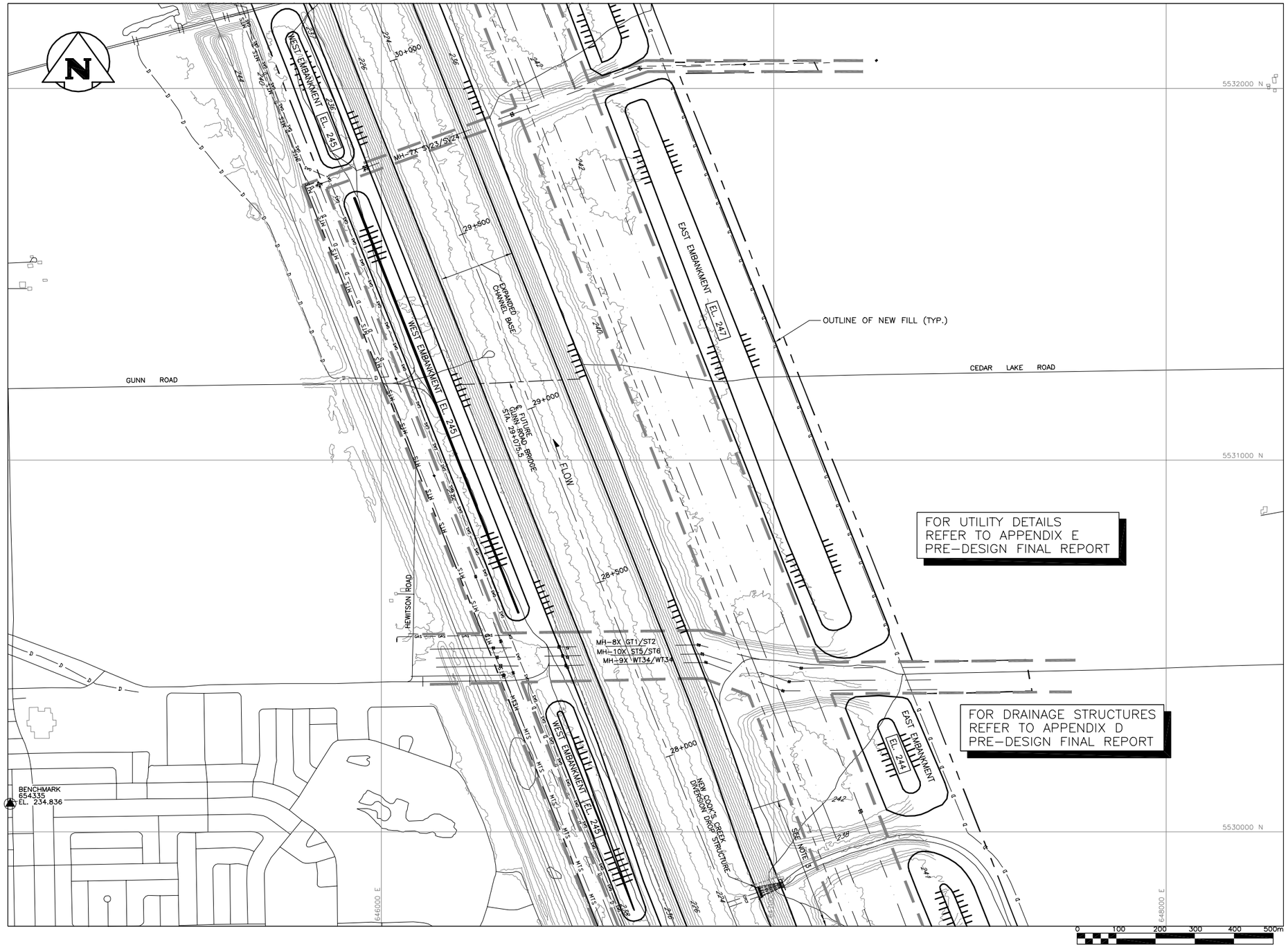
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 10 OF 19 (STA. 25+019 TO 27+511)

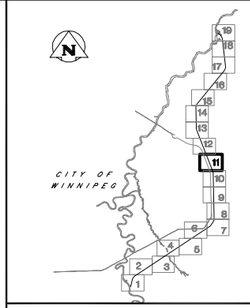
MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	010	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT010-REV00.dwg - Tab: Model
24"x36"/609x914|PLOT SCALE: 1:5

24x36B





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. EAST CHANNEL SIDE SLOPE WILL NOT BE MODIFIED AND REMAIN IN EXISTING CONDITION.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 11

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	D.B./M.R.J.	DRAWN BY:	W.G.	SCALE:	AS NOTED
CHECKED BY:	R.Ke.	APPROVED BY:	J.B.S.	DATE:	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

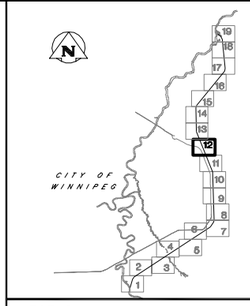
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 11 OF 19 (STA. 27+511 TO 30+162)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	011	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT011-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:1:5

24x36B



LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. WEST EMBANKMENT WITHIN LIMITS OF ROBLIN PARK SHOWN FOR INFORMATION ONLY. NO DISPOSAL MATERIAL PLACEMENT HAS BEEN ASSUMED.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.: 03-1100-02-004-SHT 12

C of A: APEGM Certificate of Authorization, KGS Group, No. 245 Expiry: April 30, 2005

ENG. STAMP: THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED BY J.B. SMITH ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT: RED RIVER FLOODWAY EXPANSION

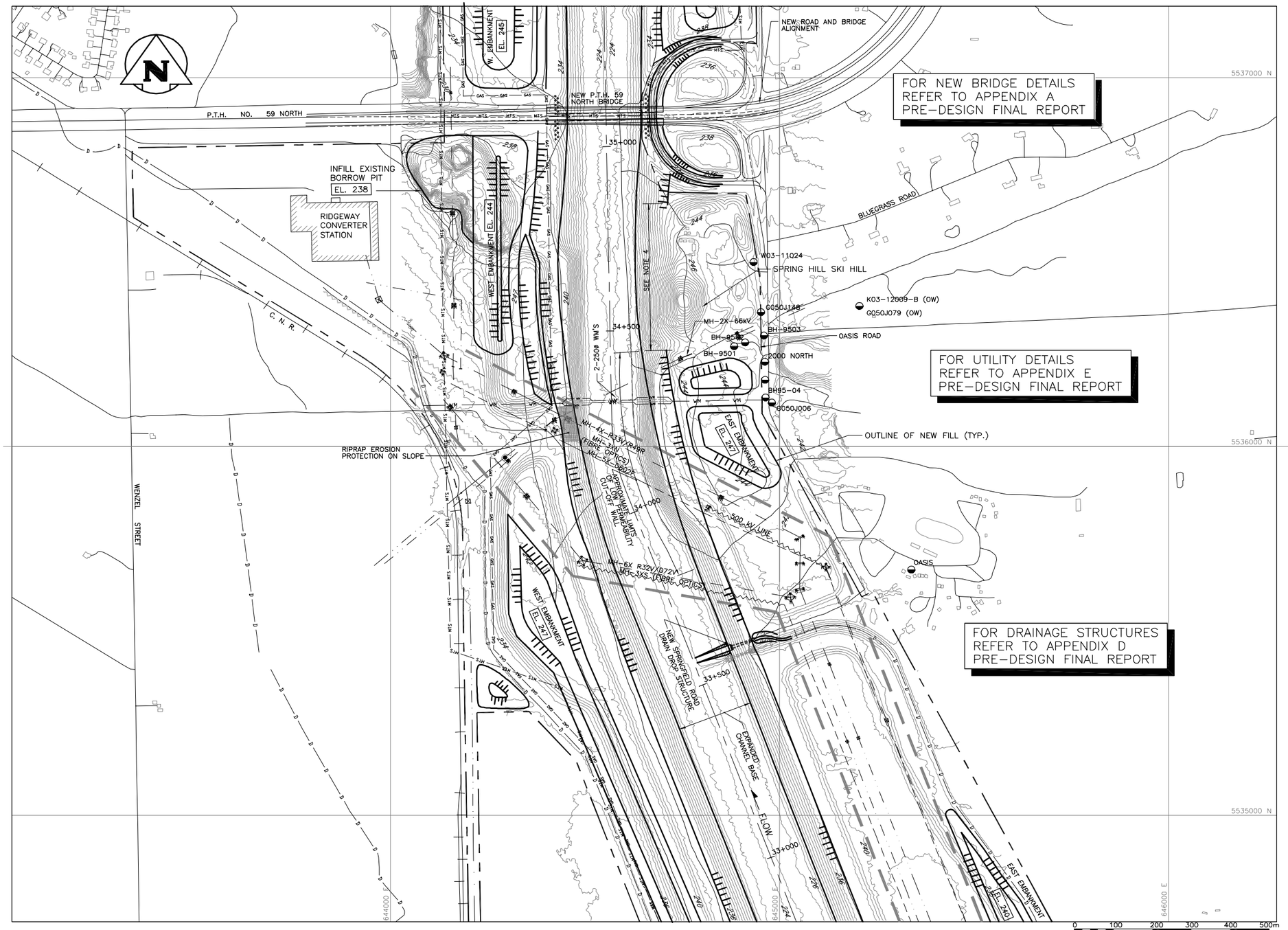
PHASE: PDEA-2 – CHANNEL – PRE-DESIGN

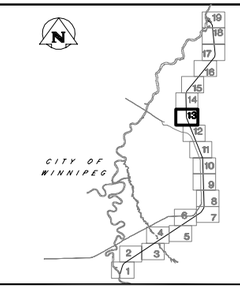
TITLE: CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 12 OF 19 (STA. 30+162 TO 32+814)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT	REV.
FE-PDEA-2-251G-004.c	012	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT012-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- HYDRO TRANSMISSION LINE EASEMENT
- OVERHEAD HYDRO LINE
- UNDERGROUND HYDRO LINE
- HYDRO TOWER (G.P.S. SURVEY) SEE NOTE 3
- HYDRO TOWER (APPROXIMATE LOCATION)
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. TRANSMISSION TOWER LOCATIONS WITHIN FLOODWAY RIGHT-OF-WAY CROSSING BASED ON GROUND SURVEY, FEB., 2004.
4. LENGTH OF CHANNEL SIDE SLOPE INDICATED WILL NOT BE MODIFIED AND WILL REMAIN IN EXISTING CONDITION.
5. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS · ACRES · UMA

CONSULTANT DWG NO.: 03-1100-02-004-SHT 13

C of A: Certificate of Authorization, KGS Group, No. 245 Expiry: April 30, 2005

ENG. STAMP: THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED BY J.B. SMITH ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER: Manitoba Floodway Expansion Authority

PROJECT: RED RIVER FLOODWAY EXPANSION

PHASE: PDEA-2 – CHANNEL – PRE-DESIGN

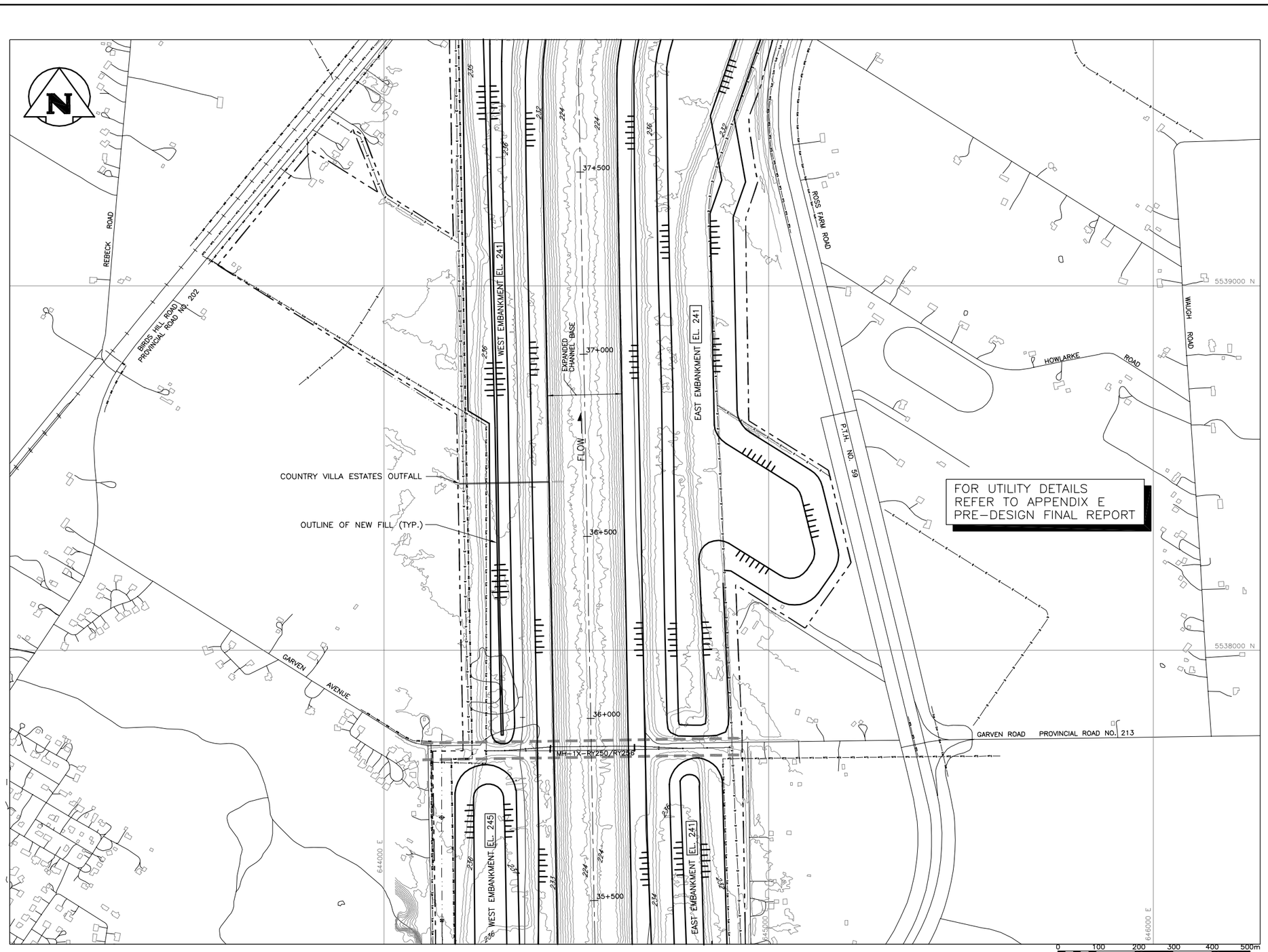
TITLE: CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 13 OF 19 (STA. 32+814 TO 35+380)

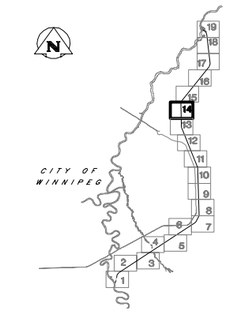
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.: FE-PDEA-2-251G-004.c

SHT.	REV.
013	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT013-REV00.dwg - Tab: Model
24"x36"/(609.914)PLOT SCALE:1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MANITOBA TELECOM SERVICES BURIED CABLE
- GAS MAIN
- DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 14

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

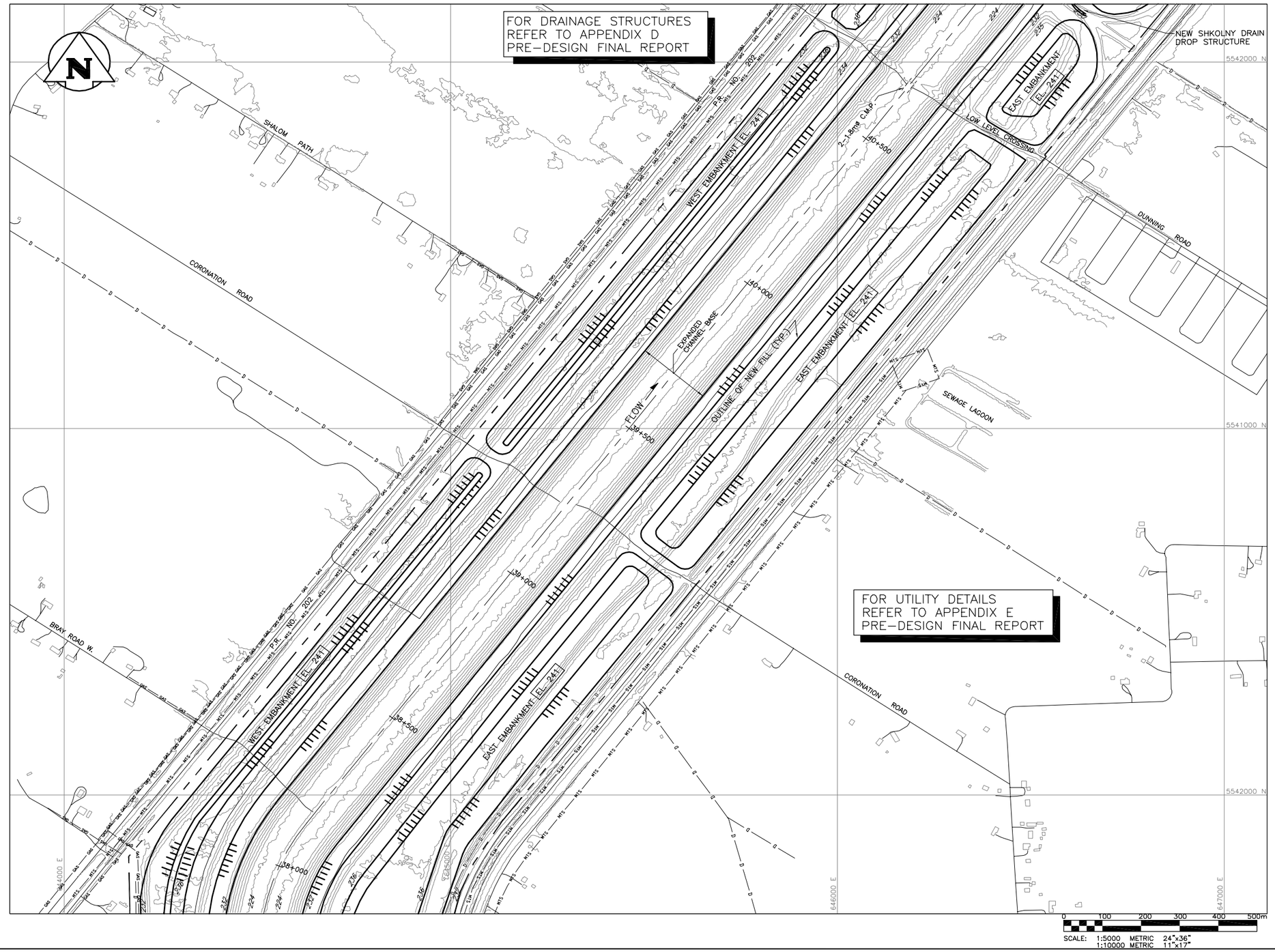
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

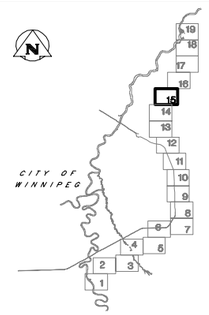
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 14 OF 19 (STA. 35+380 TO 37+864)

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	014	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT014-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.: 03-1100-02-004-SHT 15

C of A
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

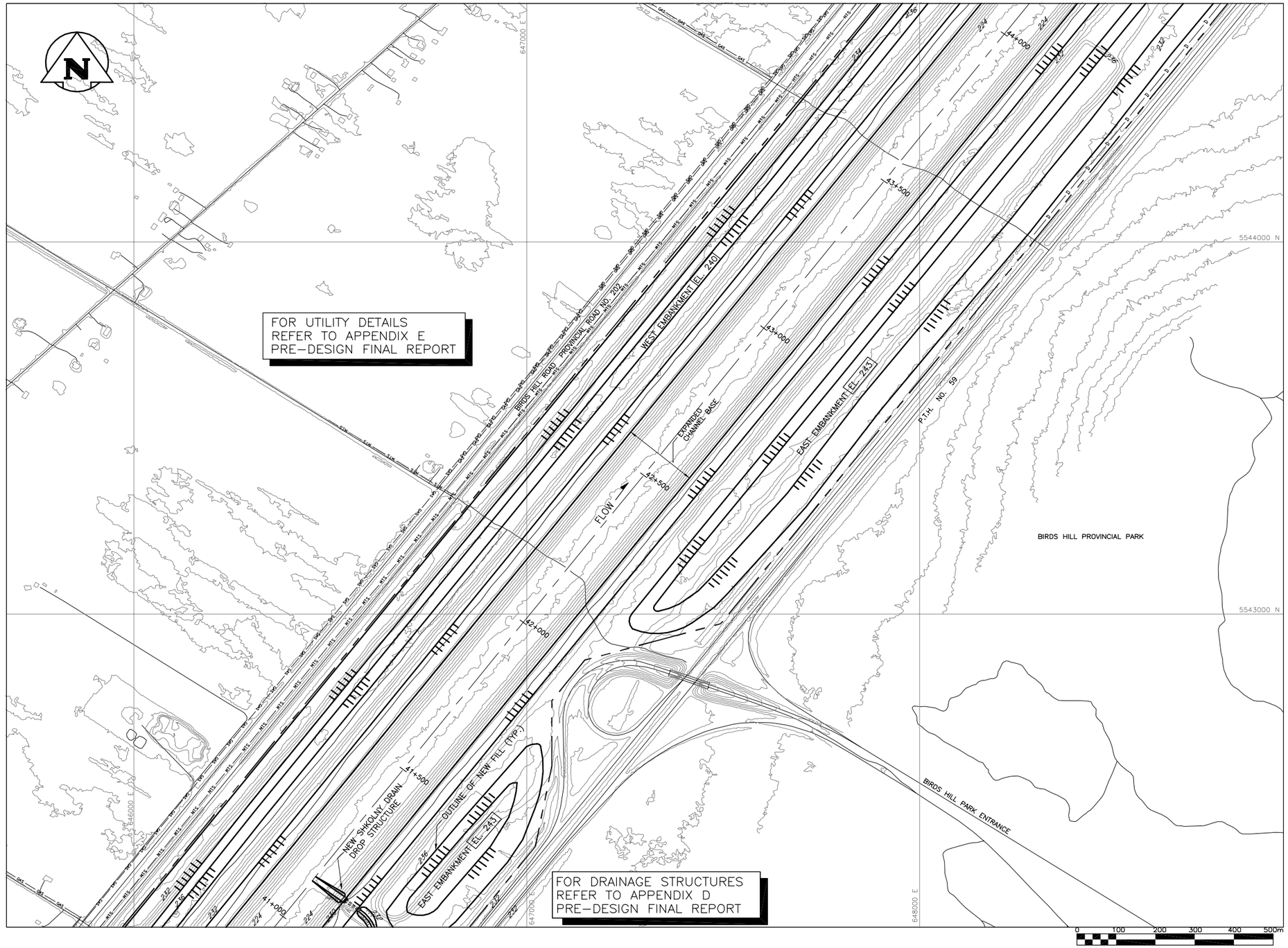
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

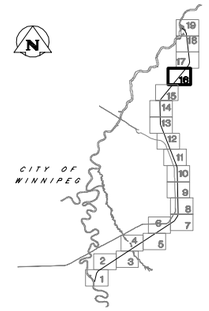
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 15 OF 19 (STA. 37+864 TO 40+964)

MFEA approvals:
VP. HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP. TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	015	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT015-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- NTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 16

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

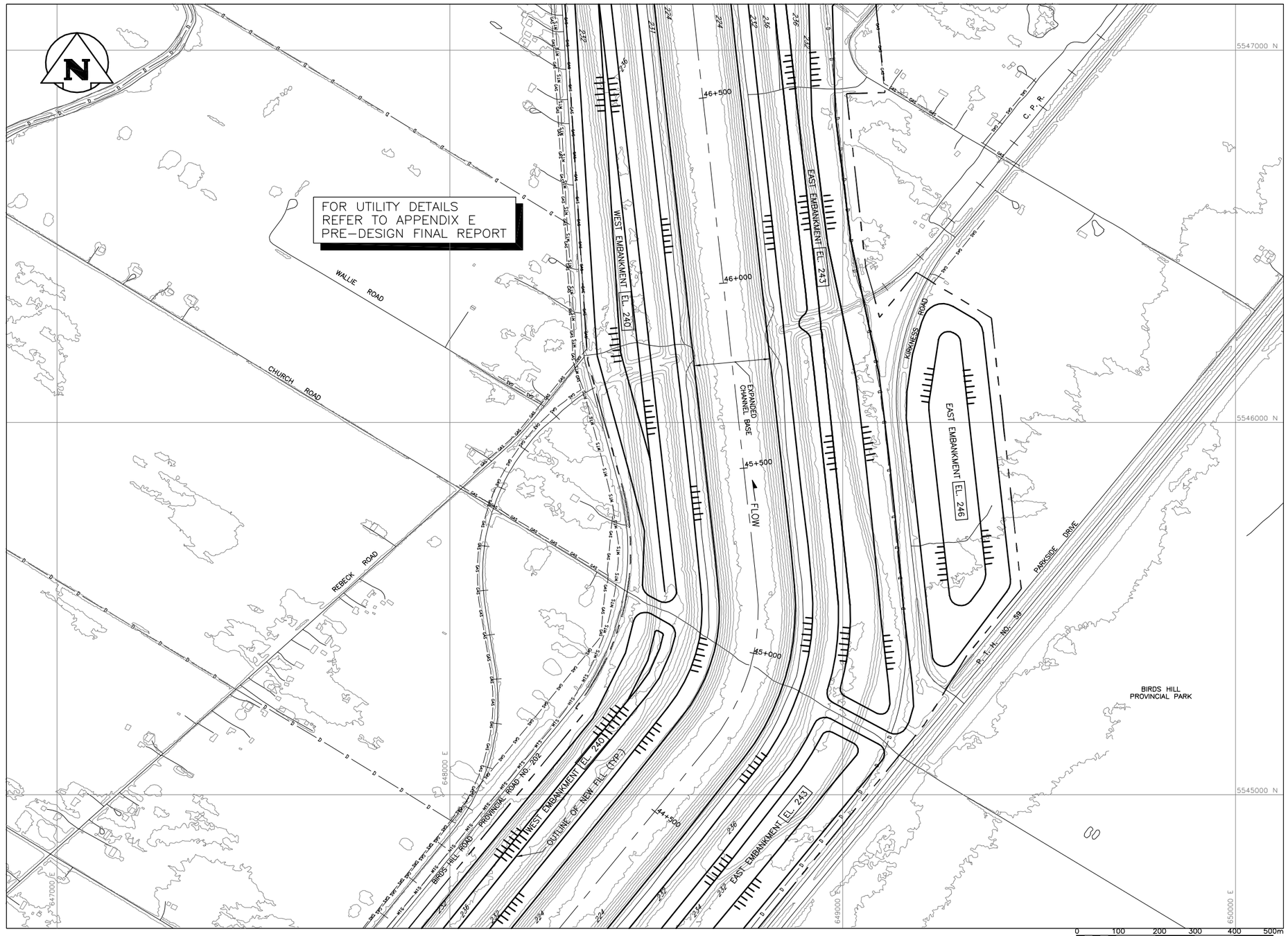
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

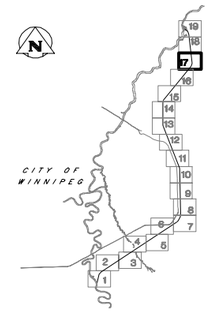
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 16 OF 19 (STA. 40+964 TO 44+104)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	016	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT016-REV00.dwg - Tab: Model
24"x36"/[609x914]PLOT SCALE: 1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.: 03-1100-02-004-SHT 17

C of A: APEGM Certificate of Authorization KGS Group No. 245 Expiry: April 30, 2005

ENG. STAMP: THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED BY J.B. SMITH ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER

Manitoba Floodway Expansion Authority

PROJECT: RED RIVER FLOODWAY EXPANSION

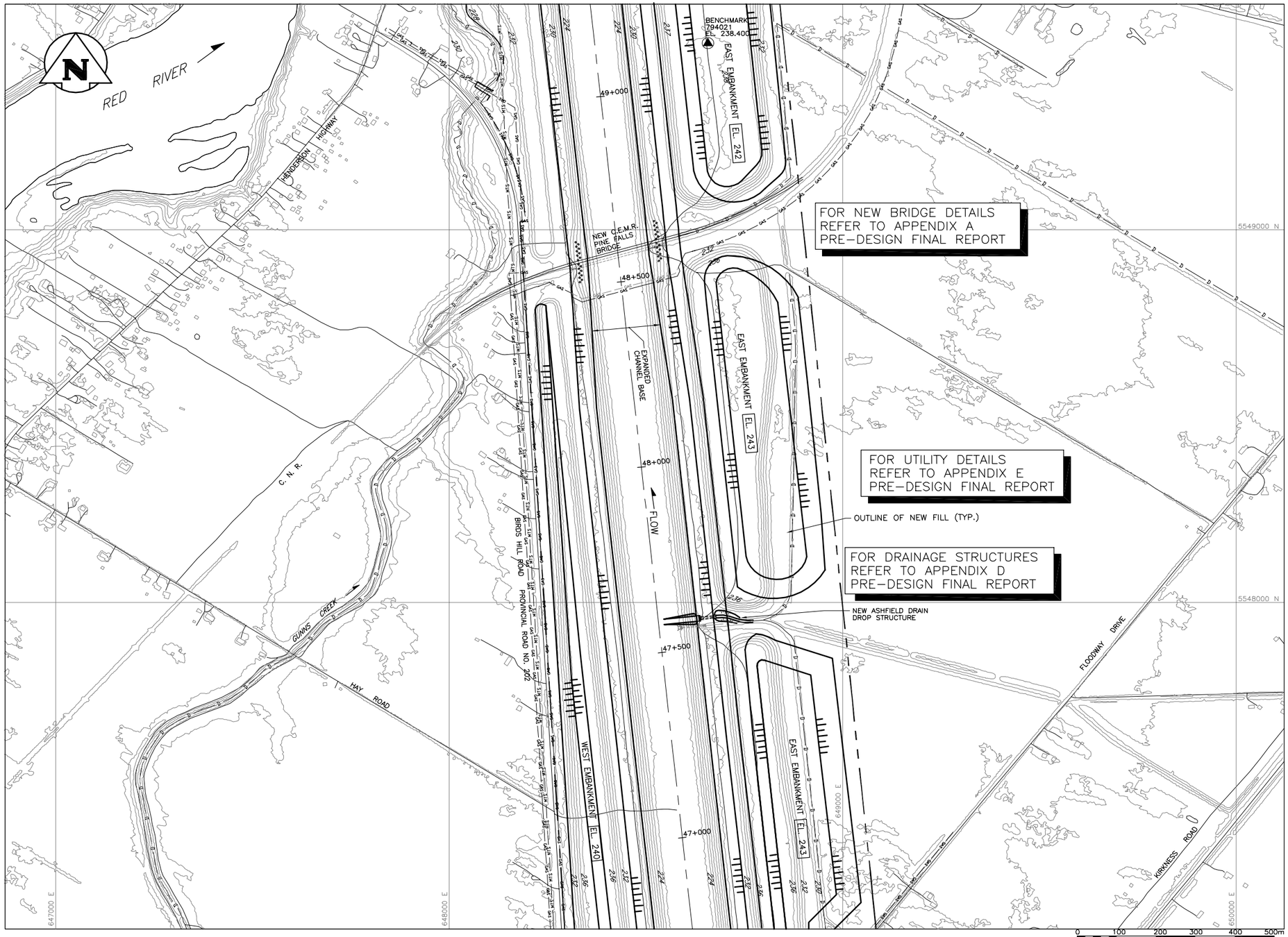
PHASE: PDEA-2 – CHANNEL – PRE-DESIGN

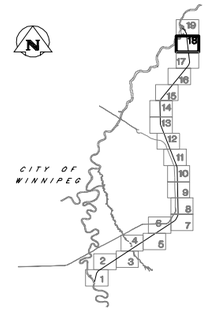
TITLE: CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 17 OF 19 (STA. 44+104 TO 46+753)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	017	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SH1017-REV00.dwg - Tab: Model
24"x36"/[609x914]PLOT SCALE: 1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT-OF-WAY
- FUTURE HYDRO TRANSMISSION LINE EASEMENT (APPROXIMATE LOCATION)
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- MTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-004-SHT 18

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

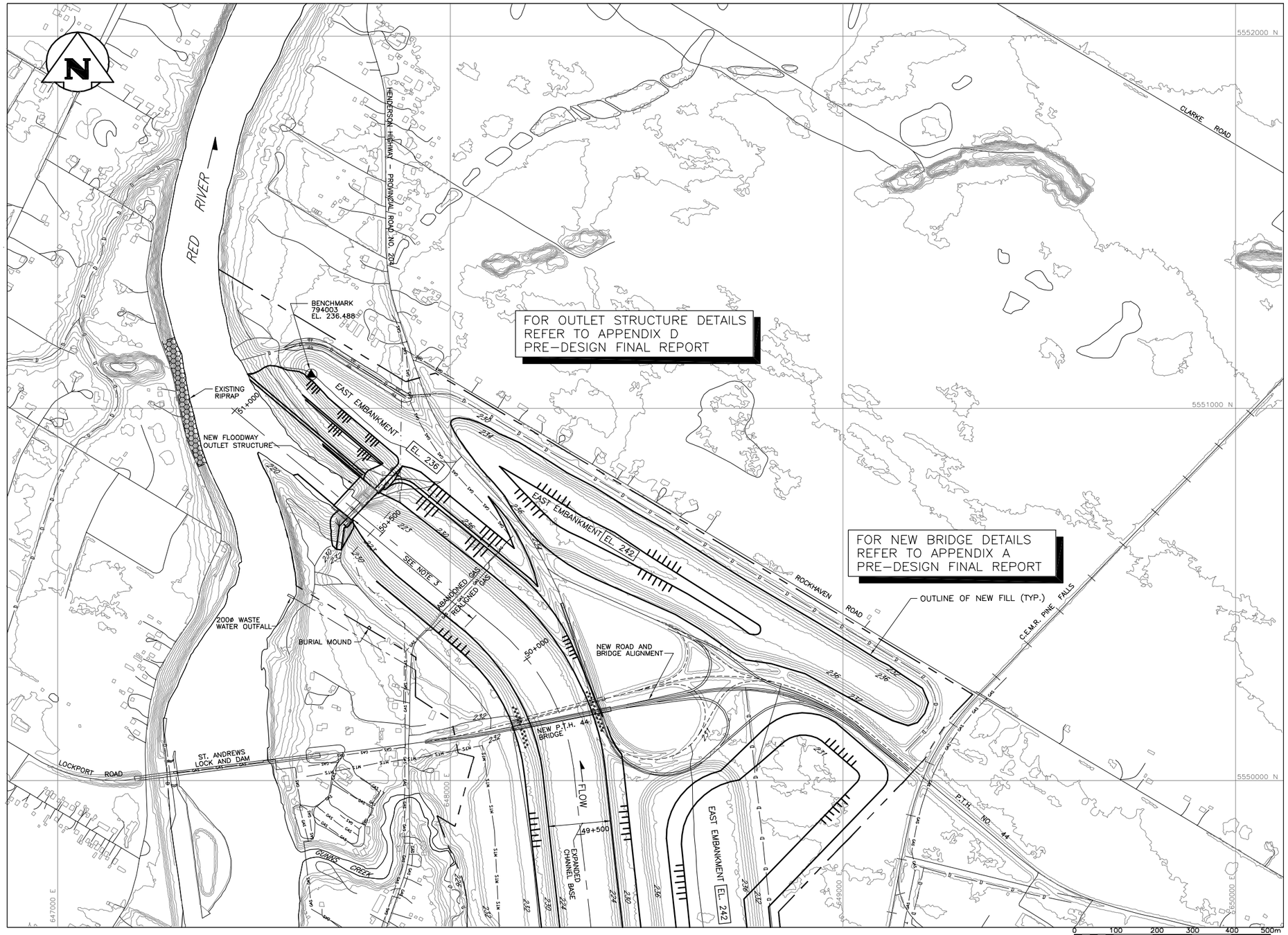
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

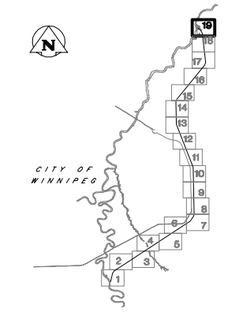
TITLE:
CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS
SHEET 18 OF 19 (STA. 46+753 TO 49+249)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-004.c	018	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT018-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:5





LEGEND:

- 226 — GROUND SURFACE CONTOUR (m) (2003 LIDAR DATA)
- CHANNEL CONTROL LINE
- 16+000 — CHANNEL CONTROL LINE STATION (m)
- EXISTING FLOODWAY CHANNEL RIGHT–OF–WAY
- OVERHEAD HYDRO LINE
- HYDRO TOWER
- UNDERGROUND HYDRO LINE
- NTS — MANITOBA TELECOM SERVICES BURIED CABLE
- GAS — GAS MAIN
- D — DRAINAGE DITCH/CHANNEL
- RAILWAY
- ROADS
- GEODETIC BENCHMARK
- ROCKFILL COLUMNS

NOTES:

1. GEOMETRY OF EXPANDED CHANNEL AND EMBANKMENTS ARE APPROXIMATE AND ARE NOT TO BE USED TO DETERMINE ACTUAL SECTION GEOMETRY.
2. U.T.M. GRID SHOWN IS BASED ON NAD 83 (C.S.R.S.) SYSTEM.
3. LENGTH OF CHANNEL SIDE SLOPE INDICATED WILL NOT BE MODIFIED AND WILL REMAIN IN EXISTING CONDITION.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.: 03–1100–02–004–SHT 19

C of A: APEGM Certificate of Authorization, KGS Group, No. 245 Expiry: April 30, 2005

ENG. STAMP: THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED BY J.B. SMITH ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.R.J.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT: RED RIVER FLOODWAY EXPANSION

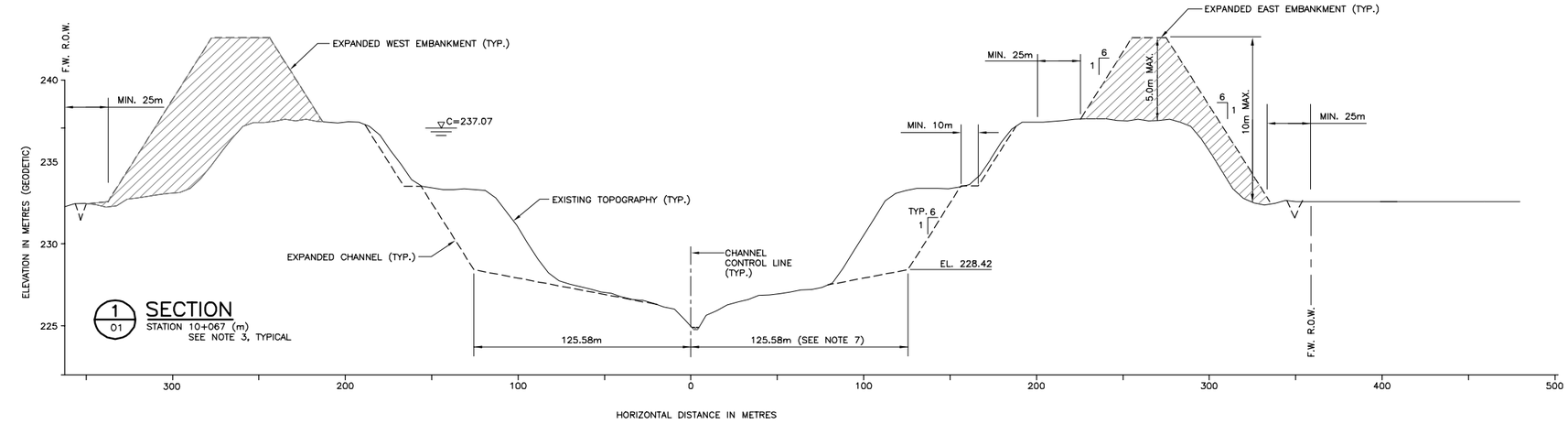
PHASE: PDEA–2 – CHANNEL – PRE–DESIGN

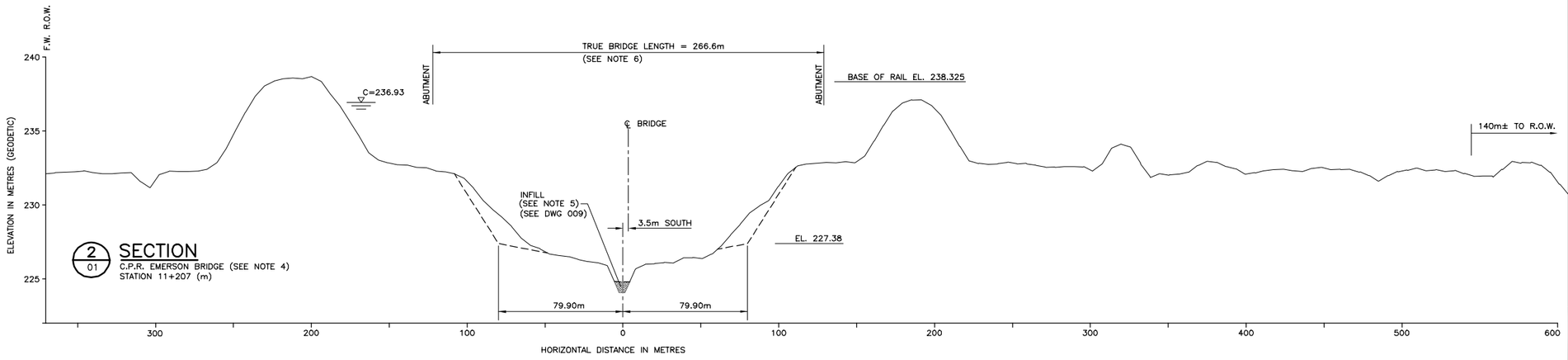
TITLE: CHANNEL EXCAVATION AND EMBANKMENT DETAILED PLANS SHEET 19 OF 19 (STA. 49+249 TO 50+598)

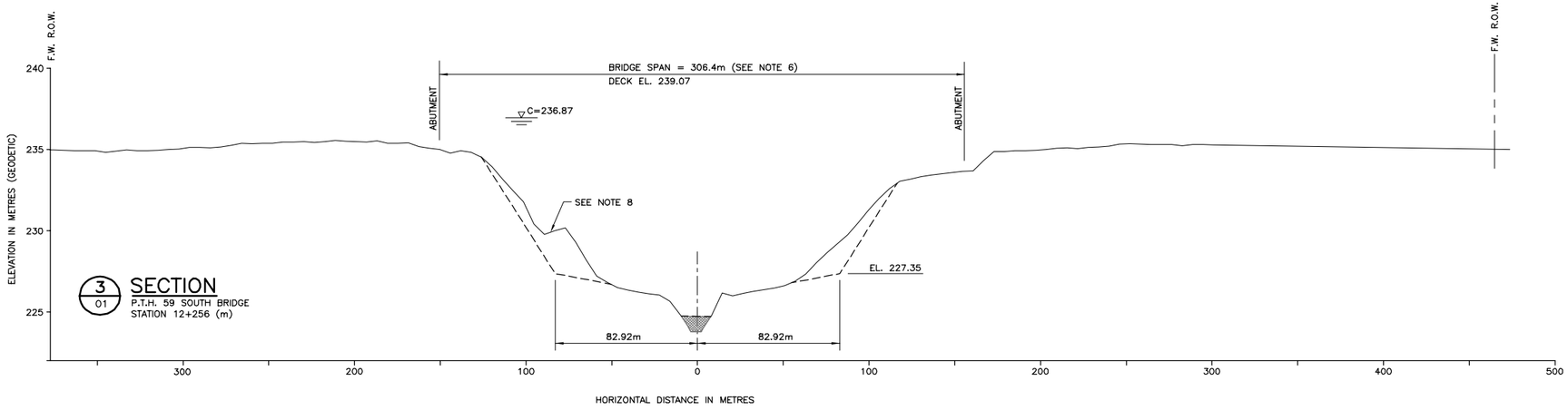
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE–PDEA–2–251G–004.c	019	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-004c-SHT019-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:1:5







LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. — EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C — 700 YEAR FLOOD LEVEL 4000 cms (140,000 cfs)
- C=235.08 — WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 1/01 — 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"

0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS · ACRES · UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 14, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B.	W.G.	AS NOTED
CHECKED BY: M.R.J.	APPROVED BY: J.B.S.	DATE: JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

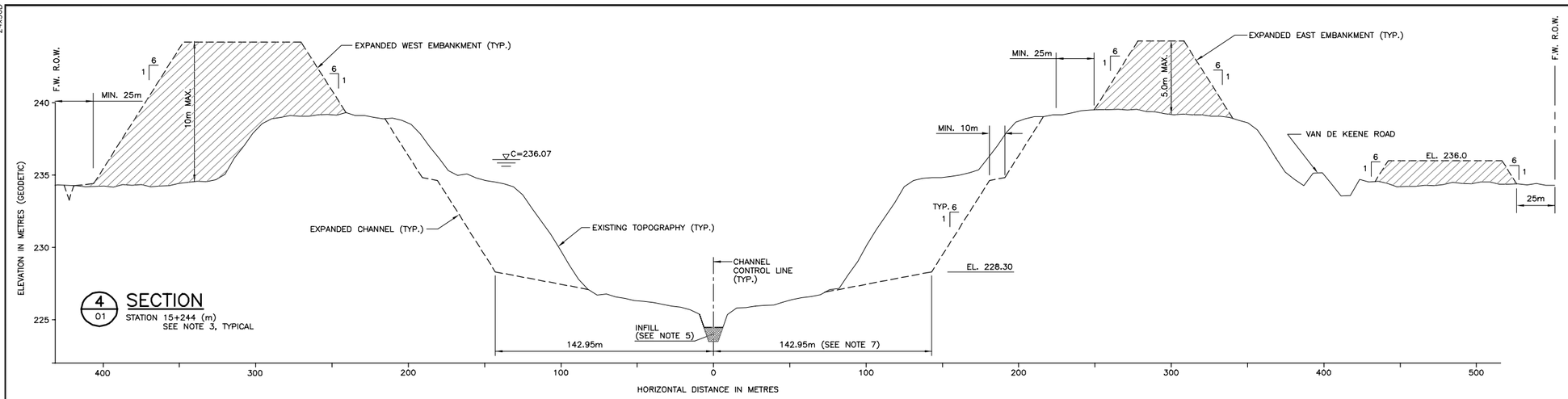
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

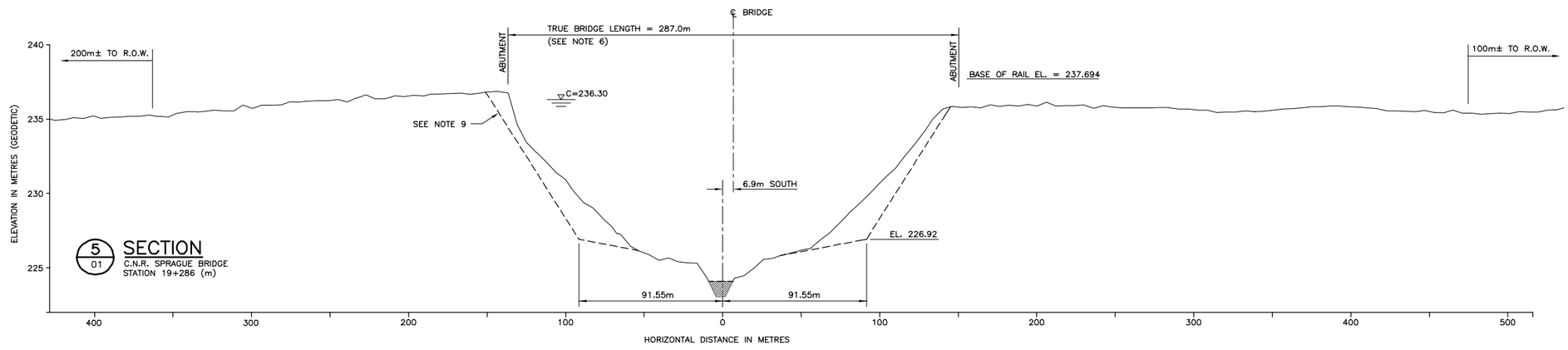
TITLE:
CHANNEL CROSS SECTIONS 1 – 17
(SHEET 1 OF 6)

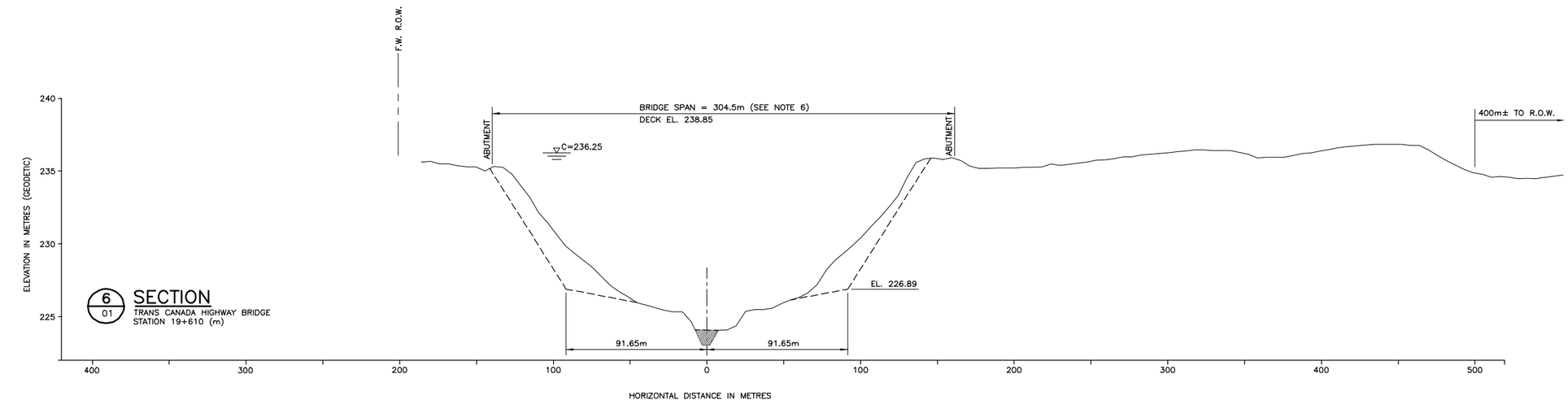
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT001-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:







LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C 700 YEAR FLOOD LEVEL 4000 cms (140,000 cfs)
- C=235.08 WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 4/01 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.
9. CHANNEL SIDE SLOPES SHOWN DO NO REFLECT LOCAL STEEPENING THAT MAY BE REQUIRED AT BRIDGE ABUTMENTS.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"
0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 2

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	D.B.	DRAWN BY:	W.G.	SCALE:	AS NOTED
CHECKED BY:	M.R.J.	APPROVED BY:	J.B.S.	DATE:	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

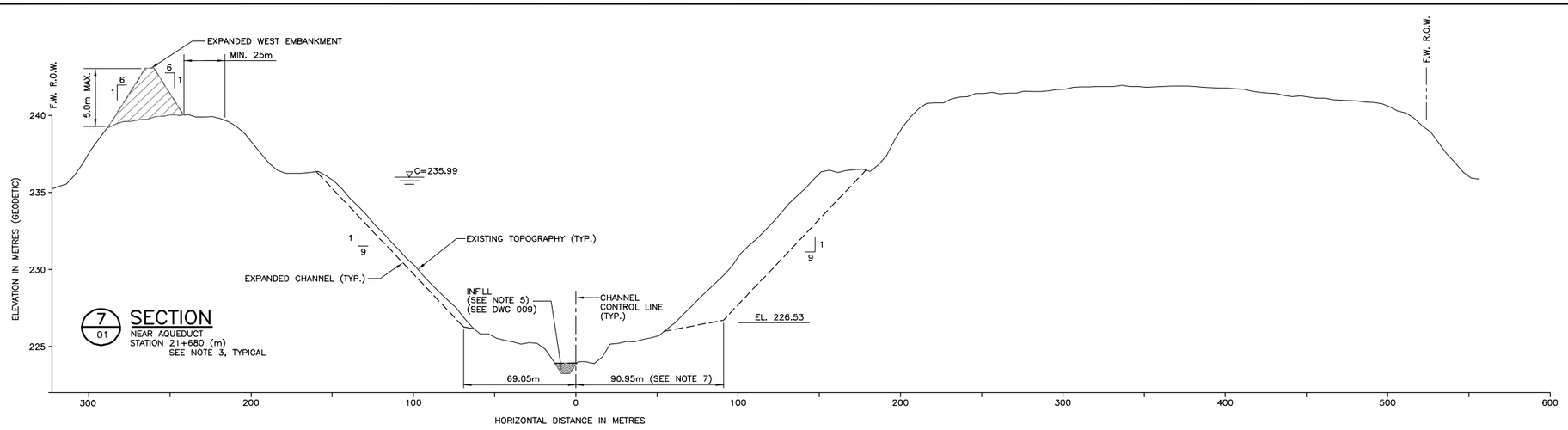
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

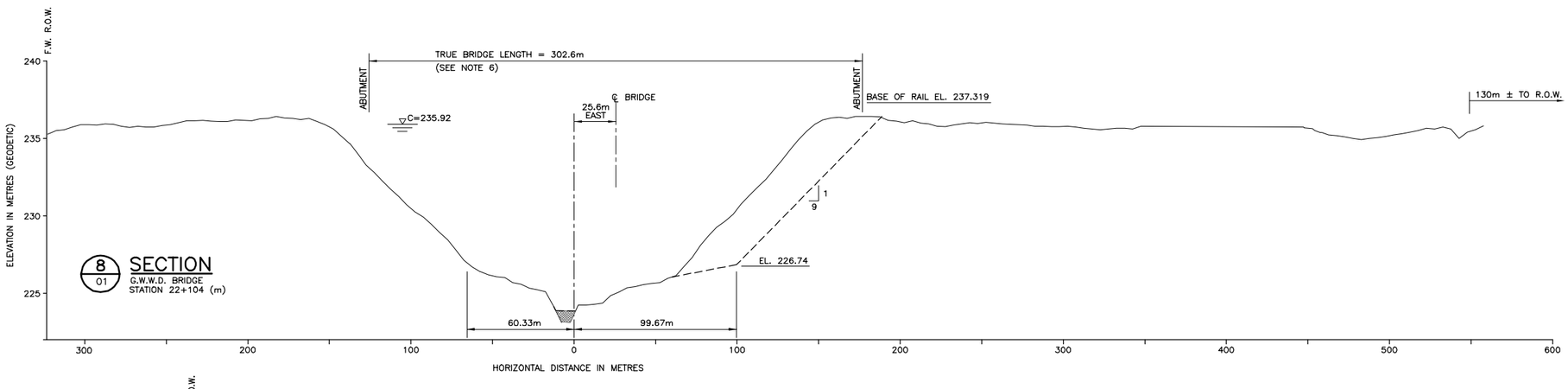
TITLE:
CHANNEL CROSS SECTIONS 1-17
(SHEET 2 OF 6)

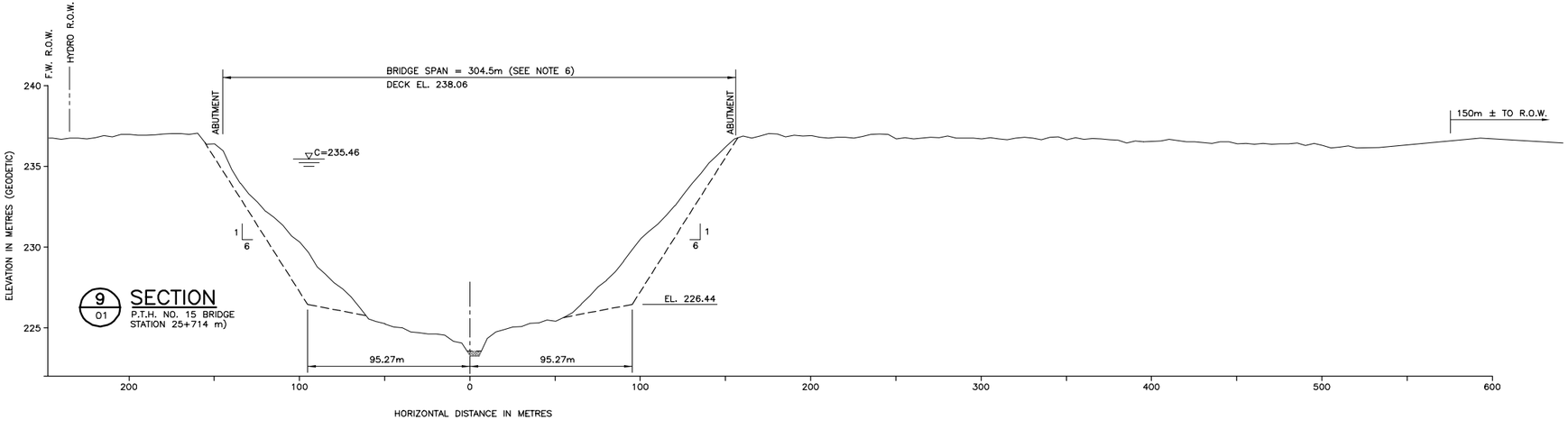
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	002	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT002-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:







LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. — EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C — 700 YEAR FLOOD LEVEL 4000 cms (140,000 cfs)
- C=235.08 — WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 7/01 — 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"

0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 3

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

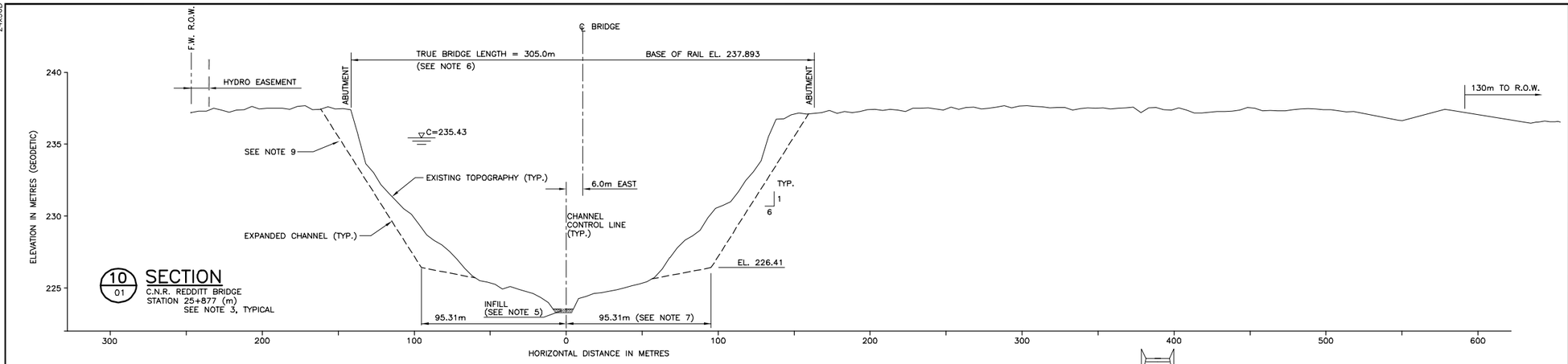
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

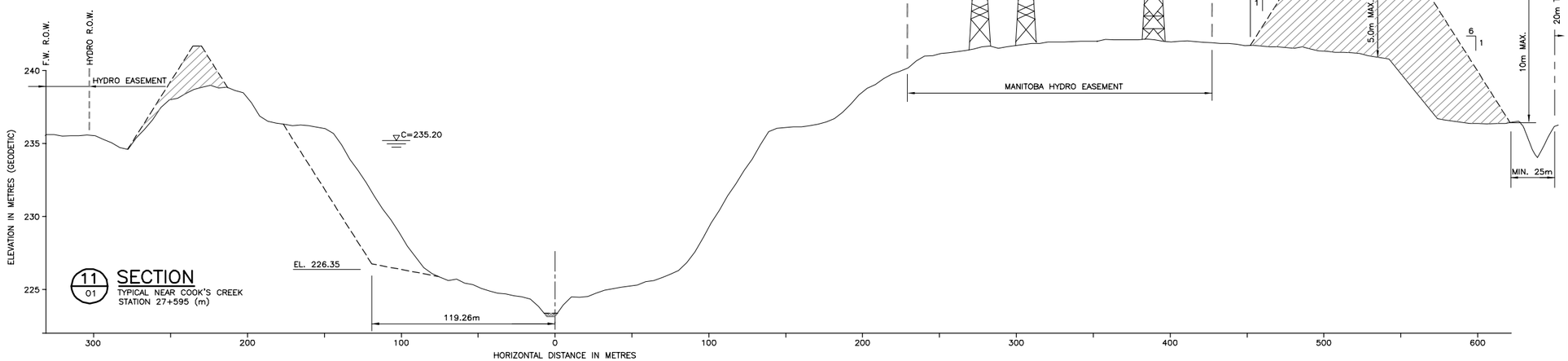
TITLE:
CHANNEL CROSS SECTIONS 1-17
(SHEET 3 OF 6)

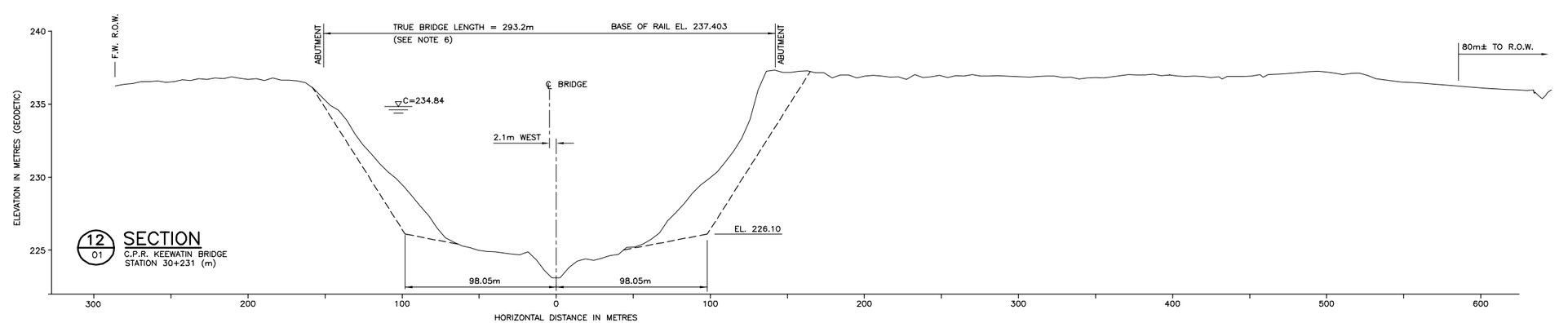
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	003	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT003-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:







LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. — EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C — 700 YEAR FLOOD LEVEL 4000 cms (140,000 cfs)
- C=235.08 — WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 10/01 — 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.
9. CHANNEL SIDE SLOPES SHOWN DO NO REFLECT LOCAL STEEPENING THAT MAY BE REQUIRED AT BRIDGE ABUTMENTS.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"
0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 4

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

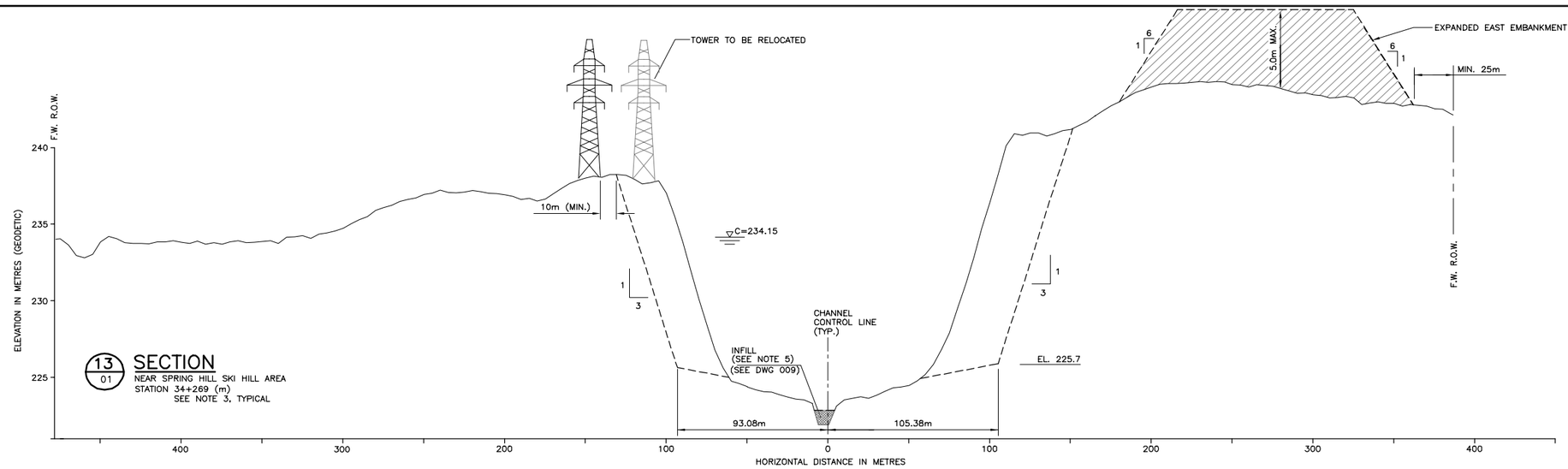
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

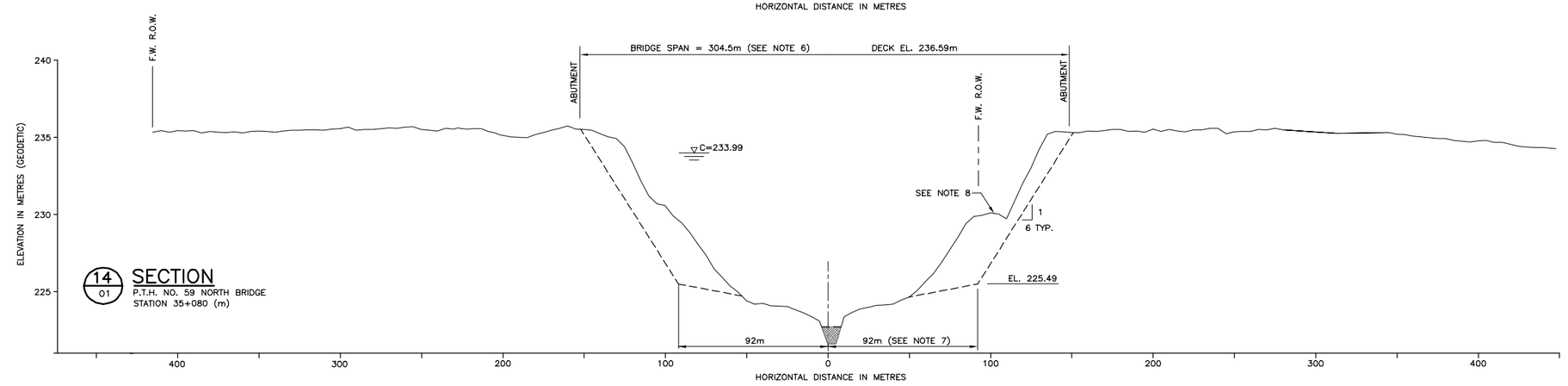
TITLE:
CHANNEL CROSS SECTIONS 1-17
(SHEET 4 OF 6)

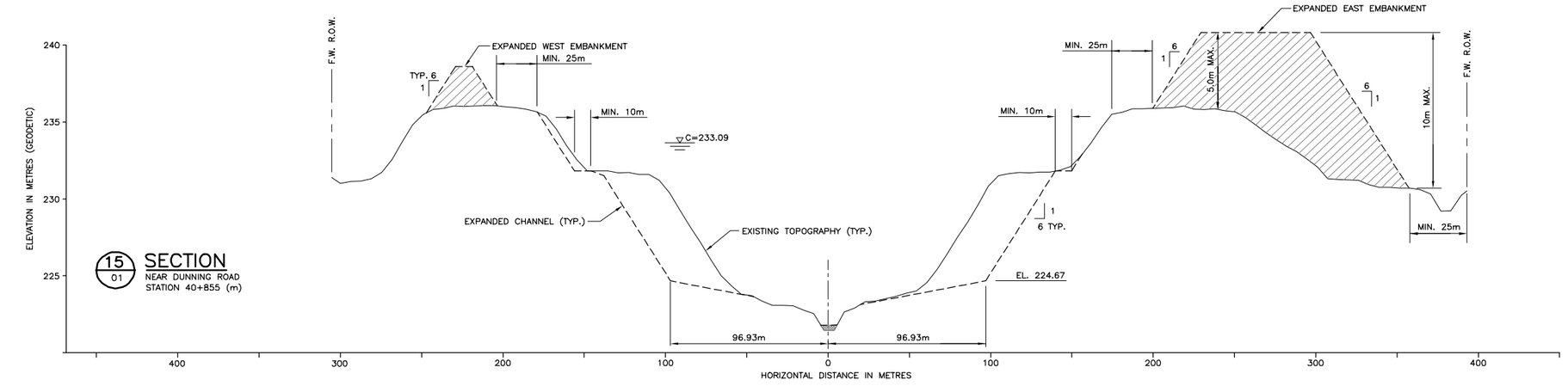
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	004	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT004-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:







LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. — EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C — 700 YEAR FLOOD LEVEL 4000 cms (140,000 cfs)
- C=235.08 — WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 13/01 — 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"
0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 5

C of A
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B.	W.G.	AS NOTED
CHECKED BY: M.R.J.	APPROVED BY: J.B.S.	DATE: JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

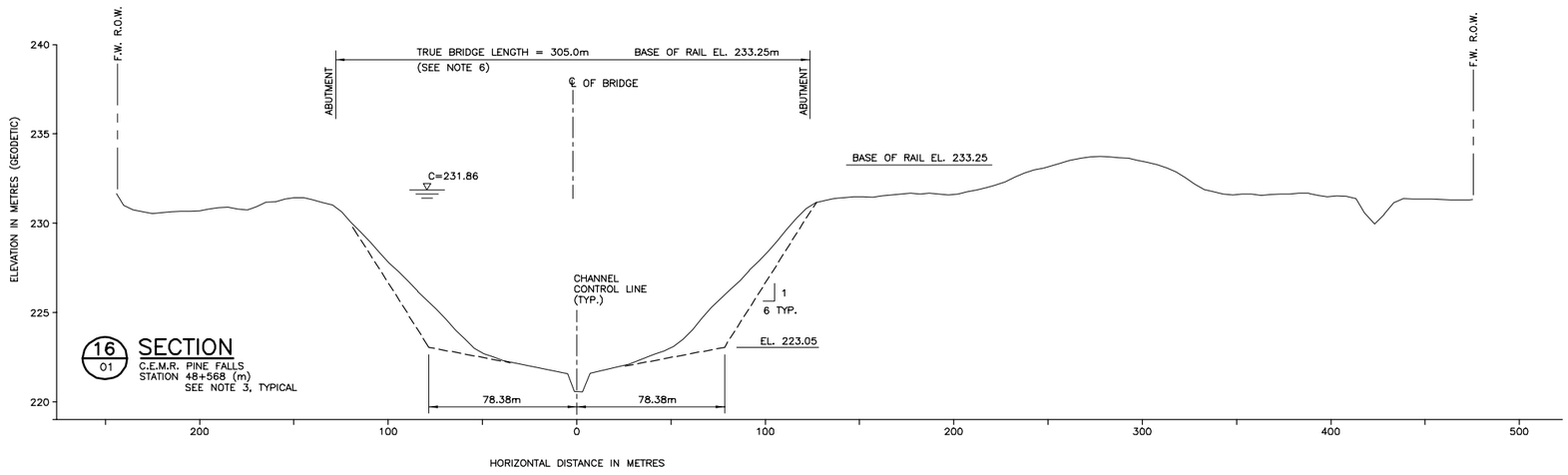
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL CROSS SECTIONS 1-17
(SHEET 5 OF 6)

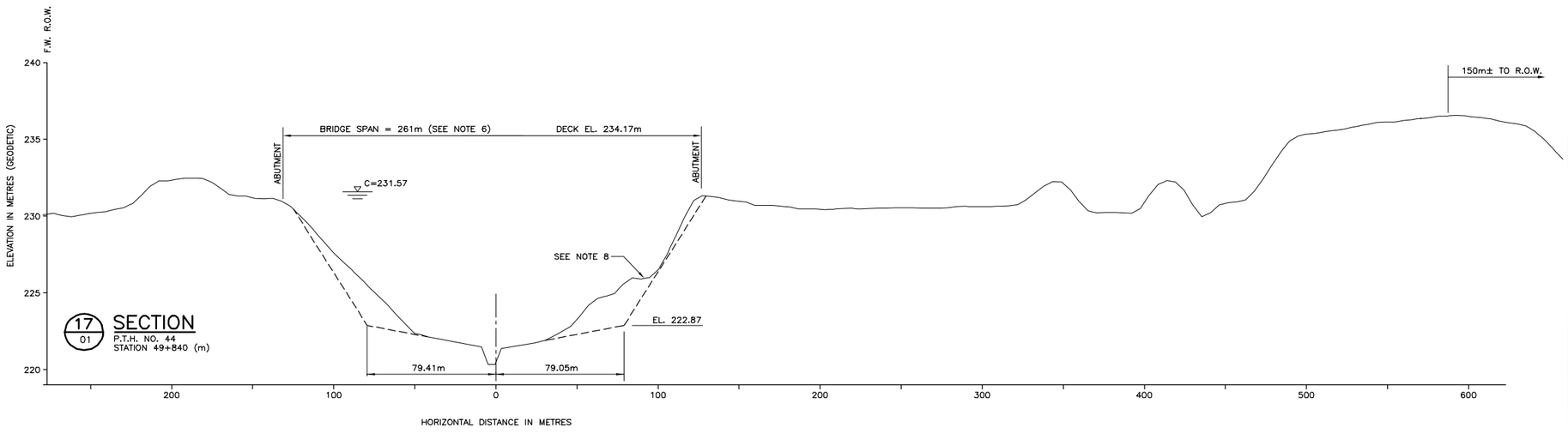
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	005	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT005-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:



16/01 SECTION
C.E.M.R. PINE FALLS
STATION 48+568 (m)
SEE NOTE 3, TYPICAL



17/01 SECTION
P.T.H. NO. 44
STATION 49+840 (m)

LEGEND:

- EXISTING GROUND SURFACE
- EXPANDED FLOODWAY CHANNEL
- EMBANKMENT FOR EXPANDED FLOODWAY
- F.W. R.O.W. — EXISTING FLOODWAY RIGHT-OF-WAY
- ▽C — 700 YEAR FLOOD LEVEL, 4000 cms (140,000 cfs)
- C=235.08 — WATER SURFACE ELEVATION AT FLOOD LEVEL (m)
- 16/01 — 01 – DRAWING FE-PDEA-2-251-G-001.c-001-00

NOTES:

1. FOR LOCATION OF SECTIONS SEE DWG 001c-SHT001. THE STATION DISTANCES ARE APPROXIMATE.
2. SECTIONS SHOWN ARE AT A RATIO OF 1 vertical to 10 horizontal.
3. METRIC STATIONING ALONG CHANNEL CONTROL LINE.
4. SECTION IS SHOWN PERPENDICULAR TO CHANNEL, COINCIDENT WITH CENTER OF BRIDGE. BRIDGE IS SKEWED TO CHANNEL AND THERE IS NO EMBANKMENT FILL AT RAIL LINE ON TOP OF CHANNEL SIDES.
5. LOW FLOW CHANNEL WILL BE INFILLED TO NEW DESIGN GRADES TO MAINTAIN POSITIVE DRAINAGE.
6. EXPANDED BRIDGE SPAN LENGTH BETWEEN ABUTMENTS IS TRUE BRIDGE LENGTH REGARDLESS OF ORIENTATION TO SECTION. BRIDGE IS ASSUMED TO BE SYMMETRICAL ABOUT CHANNEL CONTROL LINE EXCEPT WHERE NOTED.
7. EXPANDED CHANNEL BASE SHOWN TO TOE OF CHANNEL SIDE SLOPE.
8. THE EXPANDED CHANNEL GEOMETRY AT ALL BRIDGES DOES NOT SHOW UNDERPASS ACCESS ROADS. MODIFICATIONS TO THE SIDE SLOPES OR BRIDGE LENGTH MAY BE REQUIRED.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 30 60 90 120 150m
SCALE: 1:1500 METRIC 24"x36"
HORIZ. 1:3000 METRIC 11"x17"

0 3 6 9 12 15m
SCALE: 1:150 METRIC 24"x36"
VERT. 1:300 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-05-SHT 6

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

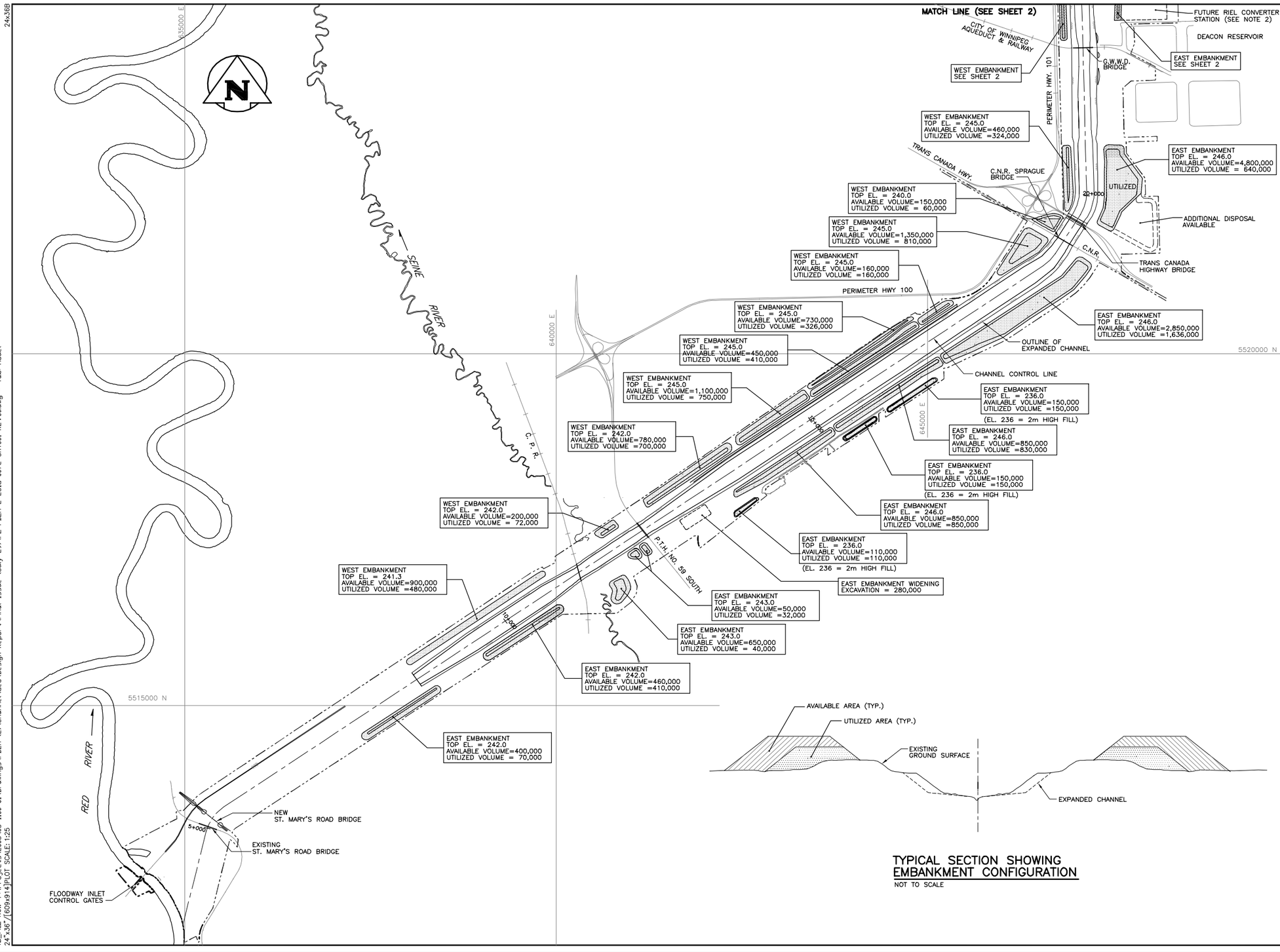
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
CHANNEL CROSS SECTIONS 1-17
(SHEET 6 OF 6)

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-005.c	006	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-005c-SHT006-REV00.dwg - Tab: Model
24"x36"/[609x914]PLOT SCALE:



TYPICAL SECTION SHOWING
EMBANKMENT CONFIGURATION
NOT TO SCALE

LEGEND

NEW EMBANKMENT FOR EXPANDED FLOODWAY

45+000 CHAINAGE ALONG CHANNEL CONTROL LINE (m)

VOLUME:

LOCATION
EMBANKMENT CREST ELEVATION
AVAILABLE VOLUME = m^3
UTILIZED VOLUME = m^3

AVAILABLE VOLUME IS THE NEAT-LINE GEOMETRY WITHIN A GIVEN DISPOSAL EMBANKMENT AVAILABLE FOR MATERIAL PLACEMENT. THE UTILIZED VOLUME ASSUMES A 20% BULKING FACTOR OF THE NEAT-LINE EXCAVATION GEOMENTRY.

NOTES

1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND LOCATION.
2. FILL PLACEMENT AT THE FUTURE RIEL CONVERTER STATION BEYOND THE EXISTING FLOODWAY R.O.W. IS SUBJECT TO DISCUSSIONS WITH MANITOBA HYDRO.
3. SEE DWG. NO. 008c FOR THE MASS HAUL DIAGRAM AND IDENTIFICATION OF ANY HAULING ACROSS THE LOW FLOW CHANNEL REQUIRED FOR DISPOSAL.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m

SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-007-SHT 1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	N.P./H.D.	DRAWN BY:	W.G.	SCALE:	AS NOTED
CHECKED BY:	R.Ke.	APPROVED BY:	J.B.S.	DATE:	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

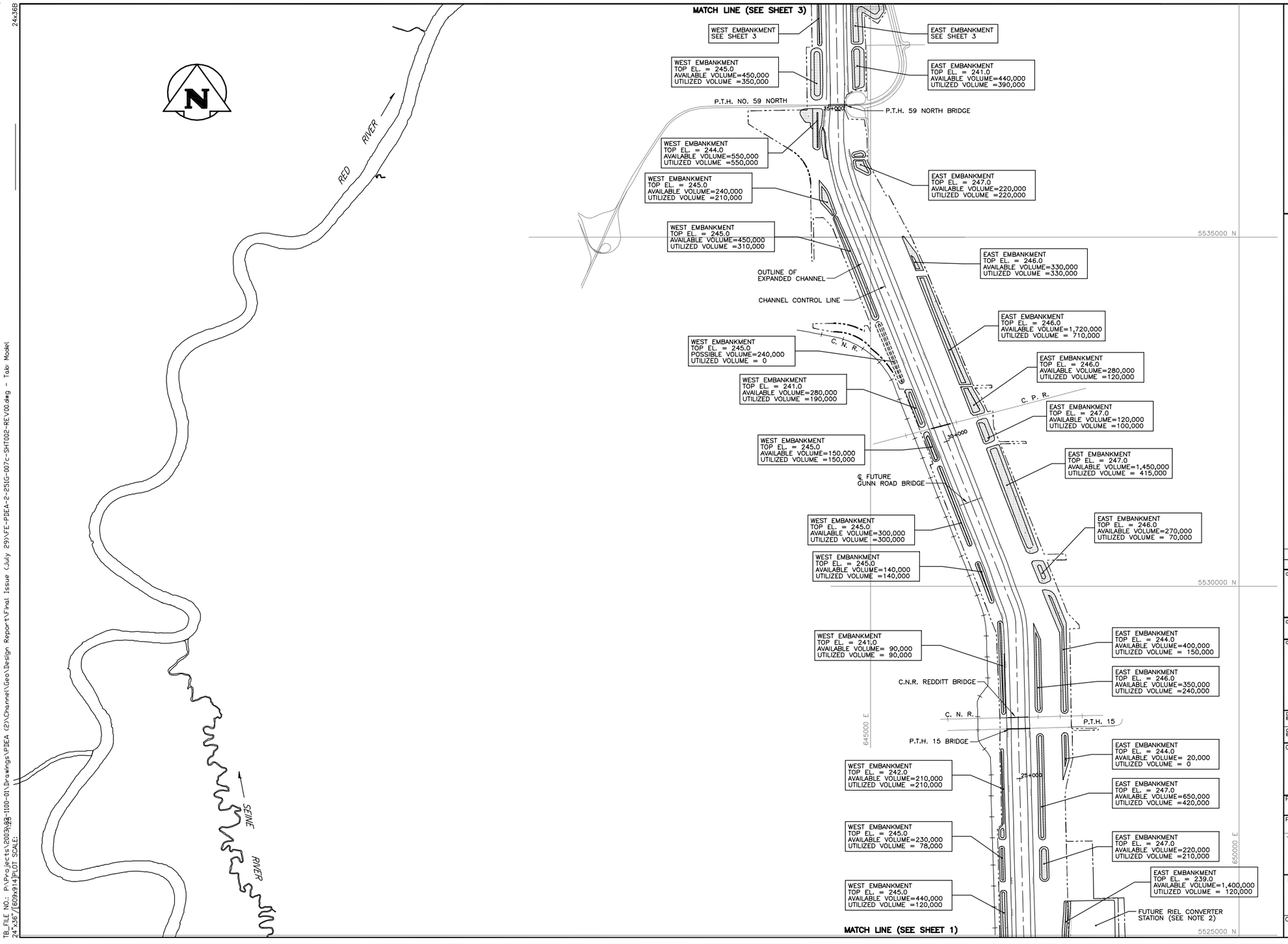
PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

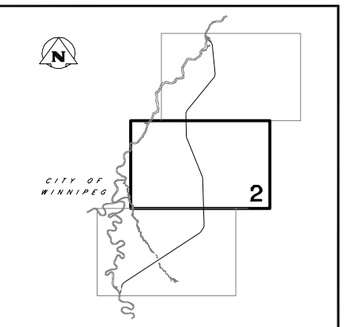
TITLE:
CHANNEL EMBANKMENTS
AVAILABLE/UTILIZED MATERIAL VOLUMES
SHEET 1 OF 3

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-007c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-007c-SHT001-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:25





LEGEND

NEW EMBANKMENT FOR EXPANDED FLOODWAY

45+000 CHAINAGE ALONG CHANNEL CONTROL LINE (m)

VOLUME:

LOCATION
EMBANKMENT CREST ELEVATION
AVAILABLE VOLUME = m^3
UTILIZED VOLUME = m^3

AVAILABLE VOLUME IS THE NEAT-LINE GEOMETRY WITHIN A GIVEN DISPOSAL EMBANKMENT AVAILABLE FOR MATERIAL PLACEMENT. THE UTILIZED VOLUME ASSUMES A 20% BULKING FACTOR OF THE NEAT-LINE EXCAVATION GEOMENTRY.

NOTES

1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND LOCATION.
2. FILL PLACEMENT AT THE FUTURE RIEL CONVERTER STATION BEYOND THE EXISTING FLOODWAY R.O.W. IS SUBJECT TO DISCUSSIONS WITH MANITOBA HYDRO.
3. SEE DWG. NO. 008c FOR THE MASS HAUL DIAGRAM AND IDENTIFICATION OF ANY HAULING ACROSS THE LOW FLOW CHANNEL REQUIRED FOR DISPOSAL.
4. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m

SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:

KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-007-SHT 2

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004
D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
N.P./H.D.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

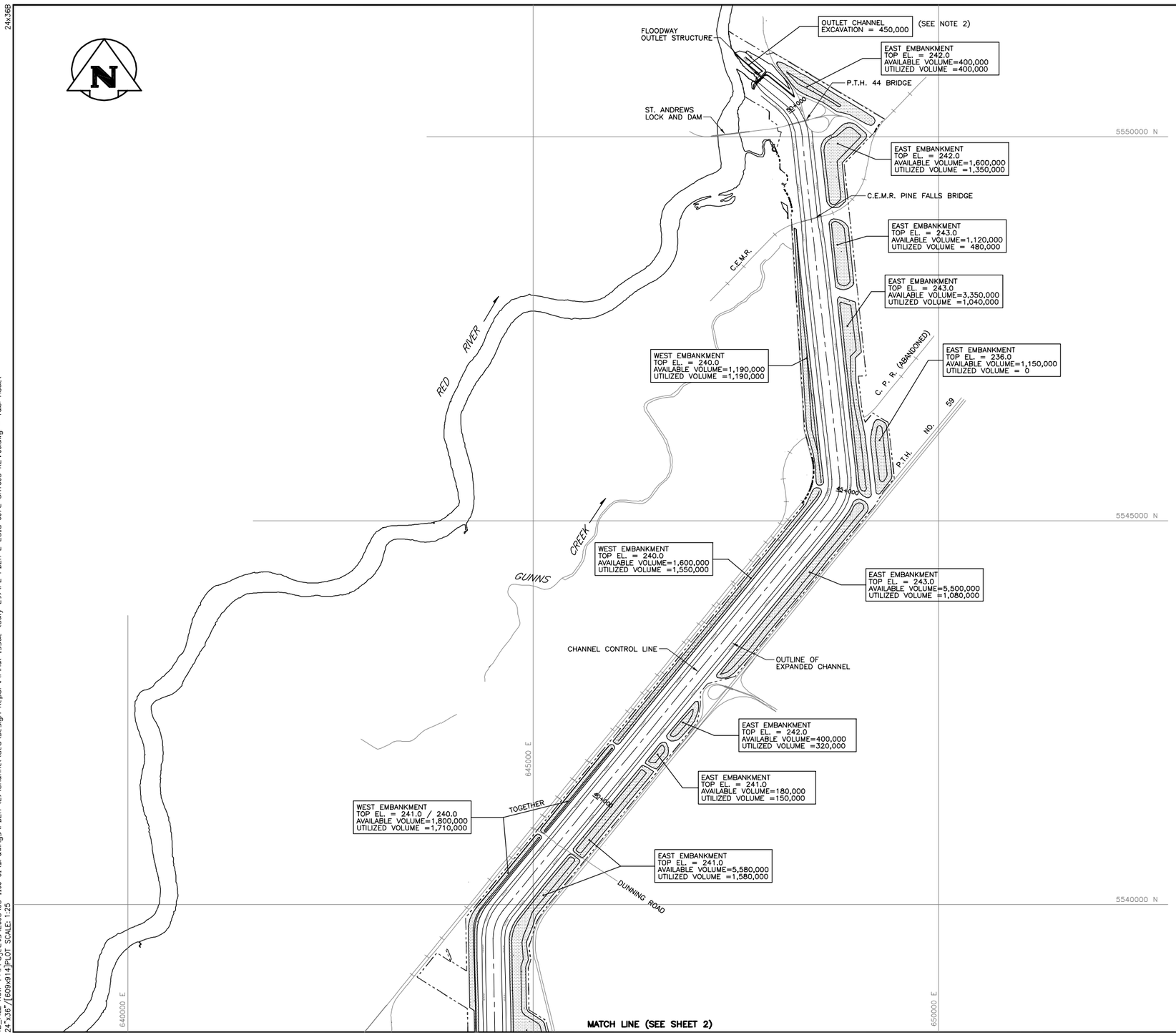
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

TITLE:
CHANNEL EMBANKMENTS
AVAILABLE/UTILIZED MATERIAL VOLUMES
SHEET 2 OF 3

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-007c	002	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-007c-SHT002-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE:



LEGEND

NEW EMBANKMENT FOR EXPANDED FLOODWAY

45+000 CHAINAGE ALONG CHANNEL CONTROL LINE (m)

VOLUME:

LOCATION
EMBANKMENT CREST ELEVATION
AVAILABLE VOLUME = m^3
UTILIZED VOLUME = m^3

AVAILABLE VOLUME IS THE NEAT-LINE GEOMETRY WITHIN A GIVEN DISPOSAL EMBANKMENT AVAILABLE FOR MATERIAL PLACEMENT. THE UTILIZED VOLUME ASSUMES A 20% BULKING FACTOR OF THE NEAT-LINE EXCAVATION GEOMENTRY.

NOTES

1. MAXIMUM HEIGHT DEPENDS ON MATERIAL TYPE AND LOCATION.
2. OUTLET CHANNEL EXCAVATION SHOWN FOR INFORMATION FOR INCLUSION INTO THE AVAILABLE DISPOSAL AREAS.
3. DISPOSAL EMBANKMENT LIMITS ARE APPROXIMATE AND TYPICALLY SHOW THE MAXIMUM AVAILABLE, EXCEPT AS NOTED. THE UTILIZED DISPOSAL SPACE IS REFLECTED ON DWG. NO. 008c.

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 500 1000 1500 2000 2500m

SCALE: 1:25000 METRIC 24"x36"
1:50000 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-02-007-SHT 3

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 15, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
N.P./H.D.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
R.Ke.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

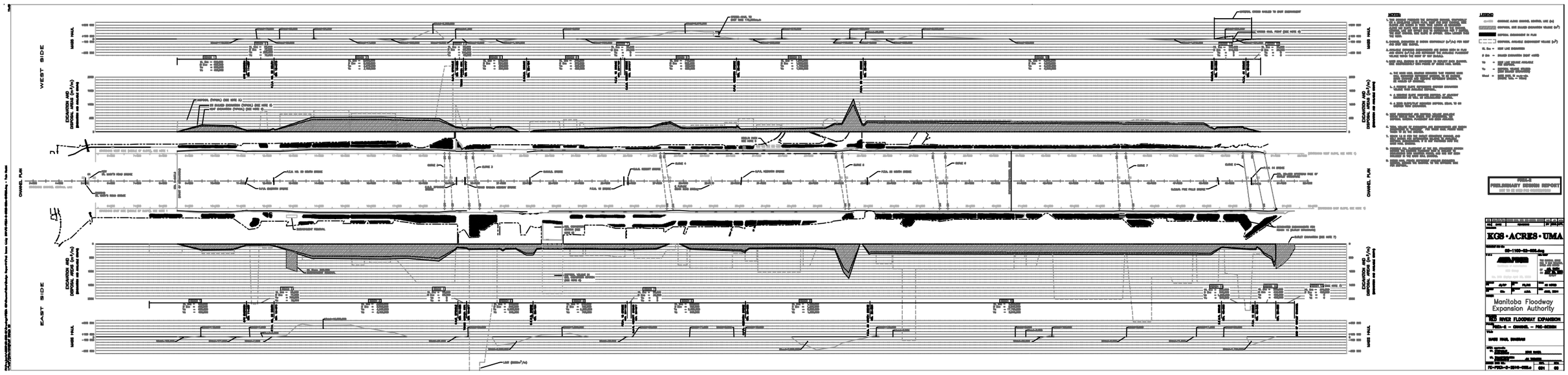
PHASE:
PDEA-2 - CHANNEL - PRE-DESIGN

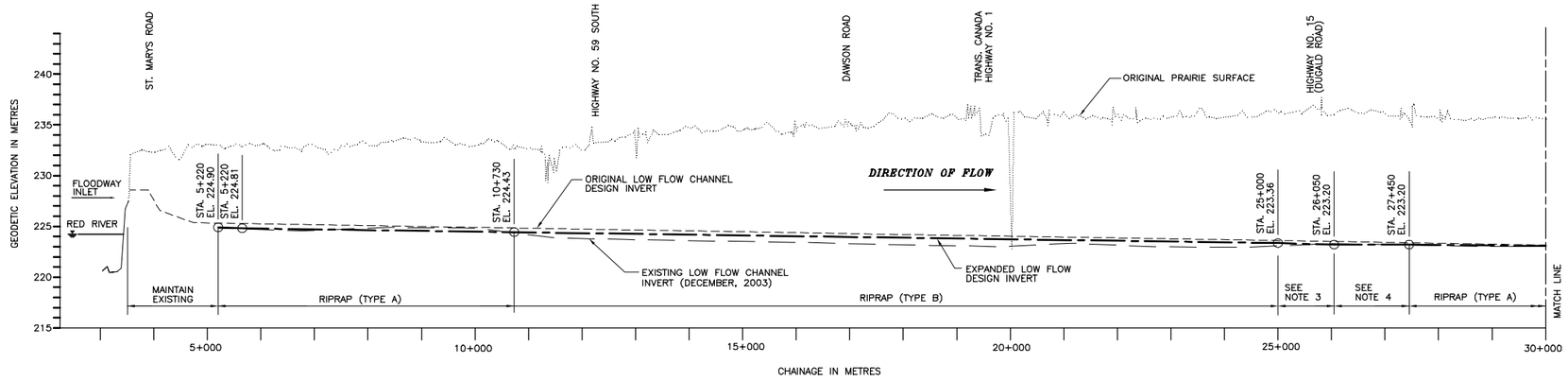
TITLE:
CHANNEL EMBANKMENTS
AVAILABLE/UTILIZED MATERIAL VOLUMES
SHEET 3 OF 3

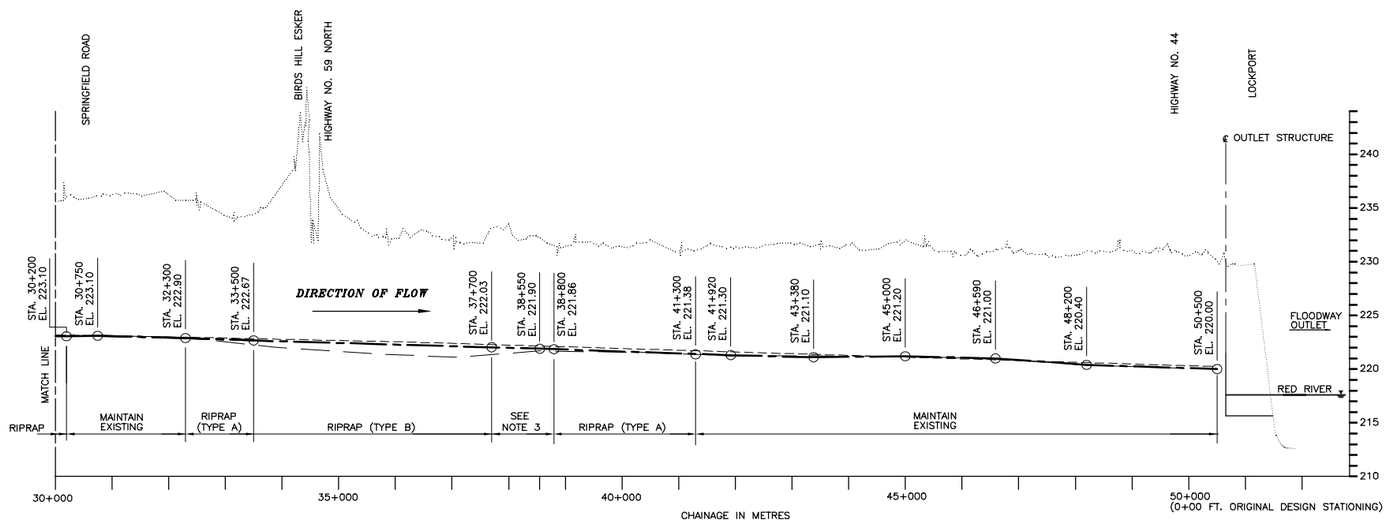
MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

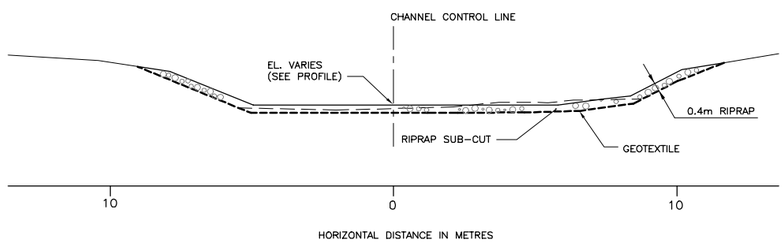
OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-007c	003	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-007c-SHT003-REV00.dwg - Tab: Model
24"x36"/(609x914)PLOT SCALE: 1:25

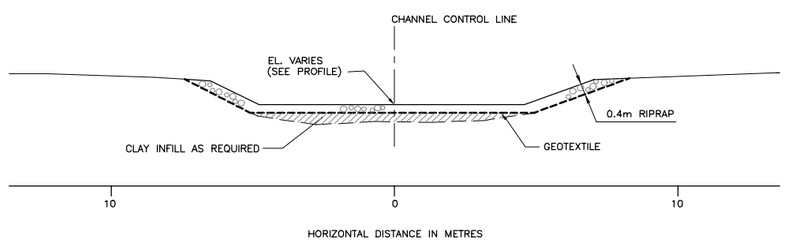

WEST SIDE
EAST SIDE
CHANNEL PLAN
MAIN WALL
NOTES:
LEGEND
FEDS-E
PRELIMINARY DESIGN REPORT
KGS · ACRES · UMA
Manitoba Floodway Expansion Authority
RED RIVER FLOODWAY EXPANSION
FEDS-E – CHANNEL – PRE-DESIGN
MAIN WALL DIAGRAM







SECTION (TYPE A) (SUB-CUT)



SECTION (TYPE B) (INFILL)

LEGEND:

○ UPGRADED LOW FLOW CHANNEL INVERT ELEVATION AND STATION

NOTES:

1. EXISTING LOW FLOW CHANNEL INVERT BASED ON KGS GROUP SURVEY DECEMBER 15 TO 23, 2003 . PROFILE DEVELOPED FROM 29 SURVEYED SECTIONS.
2. EXTENT OF SECTION TYPES IS APPROXIMATE, TRANSITION BETWEEN SECTION TYPES ASSUMED INSTANTANEOUS.
3. PLACE RIPRAP OVER EXISTING GROUND TO DESIGN INVERT TO 0.1m THICKNESS MINIMUM.
4. MAINTAIN EXISTING LOW FLOW CHANNEL GEOMETRY THROUGH TILL AREA (NO RIPRAP REQUIRED).

PDEA-2
PRELIMINARY DESIGN REPORT
NOT TO BE USED FOR CONSTRUCTION

0 1000 2000 3000 4000 5000m
SCALE: 1:50000 METRIC 24"x36"
1:100000 METRIC 11"x17"

0 2 4 6 8 10m
SCALE: 1:100 METRIC 24"x36"
1:200 METRIC 11"x17"

NO.	DATE	REVISIONS	BY	CKD.	APP.
00	29/07/04	ISSUED FINAL WITH PRE-DESIGN REPORT	WG	JS	MRJ

CONSULTANT:
KGS • ACRES • UMA

CONSULTANT DWG NO.:
03-1100-01-02-009--SHT1

C of A
APEGM
Certificate of Authorization
KGS Group
No. 245 Expiry: April 30, 2005

ENG. STAMP
THE ORIGINAL ISSUE REV. 0 WAS STAMPED, DATED AND SIGNED
BY J.B. SMITH
ON JULY 29, 2004 D/M/Y

DESIGNED BY:	DRAWN BY:	SCALE:
D.B./M.V.H.	W.G.	AS NOTED
CHECKED BY:	APPROVED BY:	DATE:
M.R.J.	J.B.S.	JUNE, 2004

OWNER
Manitoba Floodway Expansion Authority

PROJECT:
RED RIVER FLOODWAY EXPANSION

PHASE:
PDEA-2 – CHANNEL – PRE-DESIGN

TITLE:
LOW FLOW CHANNEL UPGRADING
PROFILE AND SECTIONS

MFEA approvals:
VP, HYDRAULIC ENGINEERING ..... DOUG McNEIL
VP, TRANSPORTATION ENGINEERING ..... JIM THOMSON

OWNER DWG NO.:	SHT.	REV.
FE-PDEA-2-251G-009c	001	00

TB_FILE NO.: P:\Projects\2003\03-1100-01\Drawings\PDEA (2)\Channel\Geo\Design Report\Final Issue (July 29)\FE-PDEA-2-251G-009c-SHT001-REV00.DWG - Tab: Model
24"x36"/(609x914)PLOT SCALE: