

STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWING(S):

VPF-1-24 DATED (REVISED) 7/19/2024

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

848 DATED 1/15/2021

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 17TH EDITION, INCLUDING THE 2012 INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2020.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO C&MS, SECTIONS 102.05, 105.02, AND 513.04. BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS THAT HAVE BEEN VERIFIED IN THE FIELD.

PROPOSED WORK DESCRIPTION

SUM-261D-0.664 (SFN 7708645)
-CONCRETE DECK PATCHING
-REPAIR VISIBLY UNSOUND OR PREVIOUSLY PATCHED AREAS OF THE EXISTING DECK AND REAR APPROACH SLAB.
-CONCRETE SPALL REPAIR USING ZINC RICH PRIMER
-REPAIR VISIBLY UNSOUND AREAS OF THE DECK UNDERSIDE
-DEBRIS CONTAINMENT SYSTEM INSTALLATION
-INSTALL A DEBRIS CONTAINMENT SYSTEM OVER VEHICLE, PEDESTRIAN AND TRAIN TRAFFIC. SEE SHEETS 10-16 FOR LOCATIONS
-REFURBISH AND LUBRICATE THE PIN AND HANGER ASSEMBLIES AT ALL THREE INTERMEDIATE JOINTS
-REMOVAL AND REPLACEMENT OF STRIP SEALS
-FIELD PAINT THE STEEL GIRDERS AT THE FOLLOWING LOCATIONS:
-30 FEET AT EACH PIN AND HANGER (15 FEET EACH SIDE)
-10 FEET OF THE GIRDER ENDS AT THE FORWARD AND REAR ABUT.
-REMOVE AND REPLACE THE DECORATIVE FENCING WITH A STANDARD VANDAL PROTECTION FENCE PER SCD VPF-1-24, SEE SHEETS 18-28 FOR NOTES AND DETAILS
-REMOVE AND RESEAL THE CONCRETE RAILING WITH EPOXY-URETHANE SEALER (MATCH EXISTING COLOR)
-PATCHING CONCRETE RAILING
-PATCH ALL UNSOUND AREAS OF THE CONCRETE RAILING
-SEAL PATCHES WITH EPOXY-URETHANE SEALER
-CLEARING AND GRUBBING 15 FEET AROUND THE STRUCTURE
-PROVIDE NEW AND CORRECT STRUCTURE IDENTIFICATION SIGNS

PROPOSED WORK DESCRIPTION CONT...

SUM-261-10.237R (SFN 7708653)
-CONCRETE DECK PATCHING
-REPAIR VISIBLY UNSOUND OR PREVIOUSLY PATCHED AREAS OF THE EXISTING DECK AND APPROACH SLABS.
-SPOT REPAIR CONCRETE OVERLAY
-REMOVE THE DETERIORATED EXISTING CONCRETE WEARING SURFACE NEAR INTERMEDIATE JOINT 1
-OVERLAY THE AREA WITH A FIBER REINFORCED CONCRETE OVERLAY
-CONCRETE SPALL REPAIR USING ZINC RICH PRIMER
-REPAIR VISIBLY UNSOUND AREAS OF THE DECK UNDERSIDE
-DEBRIS CONTAINMENT SYSTEM INSTALLATION
-INSTALL A DEBRIS CONTAINMENT SYSTEM OVER VEHICLE, PEDESTRIAN AND TRAIN TRAFFIC. SEE SHEETS 10-16 FOR LOCATIONS
-REFURBISH AND LUBRICATE THE PIN AND HANGER ASSEMBLIES AT ALL THREE INTERMEDIATE JOINTS
-REMOVAL AND REPLACEMENT OF STRIP SEALS
-FIELD PAINT THE STEEL GIRDERS AT THE FOLLOWING LOCATIONS:
-30 FEET AT EACH PIN AND HANGER (15 FEET EACH SIDE)
-10 FEET OF THE GIRDER ENDS AT THE FORWARD AND REAR ABUT.
-REMOVE AND REPLACE THE DECORATIVE FENCING WITH A STANDARD VANDAL PROTECTION FENCE PER SCD VPF-1-24, SEE SHEETS 18-28 FOR NOTES AND DETAILS
-REMOVE AND RESEAL THE CONCRETE RAILING WITH EPOXY-URETHANE SEALER (MATCH EXISTING COLOR)
-PATCHING CONCRETE RAILING
-PATCH ALL UNSOUND AREAS OF THE CONCRETE RAILING
-SEAL PATCHES WITH EPOXY-URETHANE SEALER
-CLEARING AND GRUBBING 15 FEET AROUND THE STRUCTURE
-PROVIDE NEW AND CORRECT STRUCTURE IDENTIFICATION SIGNS

ITEM 201 - CLEARING AND GRUBBING, AS PER PLAN, AROUND BRIDGES/STRUCTURES/CULVERTS

ALTHOUGH NO TREES OR STUMPS ARE SPECIFICALLY MARKED FOR REMOVAL WITHIN THE PLANS, A LUMP SUM QUANTITY IS INCLUDED IN THE STRUCTURE GENERAL SUMMARY FOR ITEM 201 - CLEARING GRUBBING, AS PER PLAN, AROUND BRIDGES/STRUCTURES/CULVERTS. SCALPING IS NOT REQUIRED FOR THIS ITEM OF WORK. ALL VEGETATION SHALL BE REMOVED WITHIN 15 FEET (OR TO THE R/W LIMITS, WHICHEVER IS CLOSER) OF THE HEADWALLS, ABUTMENTS AND/OR PIERS. NO WORK SHALL BE PERFORMED WITHIN THE LIMITS OF RAILROAD RIGHT-OF-WAY.

ALL OTHER PROVISIONS AS SET FORTH IN THE CMS UNDER THIS ITEM ARE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 201 – CLEARING AND GRUBBING, AS PER PLAN, AROUND BRIDGES/STRUCTURES/CULVERTS.

ITEM 514 - FIELD PAINTING STRUCTURAL STEEL (SUM-261D-0.664 & SUM-261-10.237R)

THIS ITEM OF WORK WILL CONSIST OF PAINTING 10 FEET OF THE BEAM ENDS AT EACH ABUTMENT AND 15 FEET OF THE BEAM ON BOTH SIDES OF THE PINS/HANGERS INCLUDING THE CROSSFRAMES AND BEARINGS AT BOTH THE ABUTMENTS AND PINS/HANGERS OF STRUCTURES SUM-261D-0.664 AND SUM-261-10.237R.

THE COLOR FOR THE FINISHED COAT OF STRUCTURE(S) SUM-261D-0.664 AND SUM-261-10.237R SHALL BE FEDERAL COLOR NUMBER 20045 OR 20059, WHICHEVER MATCHES EXISTING BEST AS PER THE PROJECT ENGINEER.

SPECIAL - STRUCTURES: REFURBISHING AND LUBRICATING STEEL HINGES

THIS WORK SHALL CONSIST OF REFURBISHING AND LUBRICATING THE STEEL HINGES ON STRUCTURES SUM-261D-0.000 AND SUM-261D-0.635R. WORK INCLUDES BUT IS NOT LIMITED TO REMOVING THE COVERPLATES TO INSPECT THE CONDITION OF THE PIN, CLEANING AND REMOVING ANY DEBRIS OR PACK RUST, MAKING ANY NEEDED REPAIRS, LUBRICATING THE ASSEMBLY, AND REPLACING THE TEFLON COATED WASHERS. THE REPLACEMENT OF THE PIN (IF DETERMINED NECESSARY BY THE PROJECT ENGINEER) WILL BE HANDLED BY FORCE ACCOUNT AS PER CMS. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER AND TAKE PLACE PRIOR TO COMMENCING PAINTING OPERATIONS.

REFURBISHING AND LUBRICATING STEEL HINGES WILL BE PAID AT THE UNIT BID PRICE FOR EACH SPECIAL - STRUCTURES: REFURBISHING AND LUBRICATING STEEL HINGES. THIS PRICE WILL INCLUDE THE COST OF ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO COMPLETE THE WORK.

ITEM SPECIAL – STRUCTURES: SALT REMEDIATION FOR STRUCTURAL STEEL PAINTING (SUM-261D-0.664 & SUM-261-10.237R)

IN ADDITION TO THE REQUIREMENTS OF CMS 514.13 SURFACE PREPARATION, TEST EXISTING STEEL SURFACES FOR CHLORIDE CONTAMINANTS, SOLUBLE FERROUS ION LEVELS, AND SULFATE CONTAMINANTS PRIOR TO COATING APPLICATION.

USE RELIABLE, REPRODUCIBLE TEST METHODS. THESE TESTS SHALL USE EXTRACT SOLUTIONS THAT ARE ACIDIC, FACTORY PRE-MEASURED, PRE-PACKAGED AND OF UNIFORM CONCENTRATION. THE SOLUTIONS SHALL BE MERCURY FREE. THE EXTRACTION TEST CONTAINER SHALL CREATE A SEALED, ENCAPSULATED ENVIRONMENT DURING SALT ION EXTRACTION FROM HORIZONTAL, VERTICAL, CURVED, SMOOTH, PITTED AND ROUGH STEEL SURFACES. ALL SALT ION CONCENTRATION SHALL BE DIRECTLY MEASURED IN MICROGRAMS PER SQUARE CENTIMETER OR GAINS PER SQUARE INCH.

PERFORM THREE TESTS FOR THE FIRST 1000 SQUARE FEET AND ONE TEST FOR EACH ADDITIONAL 2000 SQUARE FEET OR PART THEREOF. EACH STRUCTURE SHALL HAVE A MINIMUM OF 3 TEST PERFORMED. THE ENGINEER WILL SELECT TEST LOCATIONS AT AREAS OF COATING FAILURE AND AREAS OF CORROSION PITTING. RE-BLAST TESTED AND CLEANED AREAS AND RE-TEST UNTIL ALL REQUIRED TESTS SHOW RESULTS LESS THAN 7 MICROGRAMS PER SQUARE CENTIMETER (0.0007 GRAINS PER SQUARE INCH) OF CHLORIDE CONTAMINANTS, LESS THAN 10 MICROGRAMS PER SQUARE CENTIMETER (0.001 GRAINS PER SQUARE INCH) OF SOLUBLE FERROUS ION LEVELS, OR LESS THAN 17 MICROGRAMS PER SQUARE CENTIMETER (0.0017 GRAINS PER SQUARE INCH) OF SULFATE CONTAMINANTS. METHODS OF REMOVAL OF SOLUBLE SALT CONTAMINATION MAY INCLUDE ABRASIVE BLAST CLEANING, HIGH PRESSURE WATER RINSING, STEAM CLEANING, AND CLEANING USING A SOLUTION OF WATER WASHING AND SOLUBLE SALTS REMOVER. THE SOLUBLE SALTS REMOVER SHALL BE BIODEGRADABLE, NONTOXIC, NONCORROSIVE, AND AFTER APPLICATION, SHALL NOT INTERFERE WITH PRIMER ADHESION.

CONTAIN, COLLECT, CHARACTERIZE AND LEGALLY DISPOSE OF ALL WASTE WATER AND SLUDGE GENERATED DURING THE WORK. DO NOT MIX WASTE WATER WITH STORM WATER. DO NOT DISCHARGE ANY WASTE WATER WITHOUT THE APPROPRIATE REGULATORY PERMITS. MANAGE WASTE WATER AND SLUDGE IN ACCORDANCE WITH ORC CHAPTER 6111 AND ALL OTHER LAWS, REGULATIONS, PERMITS AND LOCAL ORDINANCES RELATING TO THIS WASTE. WASTE WATER MANAGEMENT IS INCIDENTAL TO THE WORK UNLESS OTHERWISE SPECIFIED IN THE CONTRACT.

PAYMENT FOR THIS ITEM SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE TESTING, REMOVAL, CONTAINMENT, COLLECTION, CHARACTERIZATION AND DISPOSAL OF THE SOLUBLE SALT CONTAMINATION FROM THE STRUCTURAL STEEL ON A PER HOUR BASIS FOR ITEM SPECIAL – STRUCTURES: SALT REMEDIATION FOR STRUCTURAL STEEL PAINTING

ITEM 519 - PATCHING CONCRETE STRUCTURES, AS PER PLAN

PRIOR TO THE SURFACE CLEANING SPECIFIED IN C&MS 519.04 AND WITHIN 24 HOURS OF PLACING PATCHING MATERIAL, BLAST CLEAN ALL SURFACES TO BE PATCHED INCLUDING THE EXPOSED REINFORCING STEEL. ACCEPTABLE METHODS INCLUDE: HIGH-PRESSURE WATER BLASTING WITH, OR WITHOUT, ABRASIVES IN THE WATER, ABRASIVE BLASTING WITH CONTAINMENT OR VACUUM ABRASIVE BLASTING.

SUM-261D-0.664 (CONCRETE RAILING)
-ITEM 519, PATCHING CONCRETE STRUCTURES, AS PER PLAN 100 SF

SUM-261-10.237R (CONCRETE RAILING)
-ITEM 519, PATCHING CONCRETE STRUCTURES, AS PER PLAN 50 SF

ITEM 516 - ARMORLESS PREFORMED JOINT SEAL

THIS ITEM OF WORK CONSISTS OF CLEANING, INSPECTING, AND INSTALLING NEW ARMORLESS PREFORMED JOINT SEALS. PRIOR TO REMOVING THE EXISTING SEAL THE CONTRACTOR SHALL CLEANOUT AND INSPECT EACH JOINT. ALL DAMAGED OR TORN JOINT SEALS SHALL BE REPLACED UPON THE DIRECTION OF THE ENGINEER. FOR ADDITIONAL NOTES AND DETAILS, SEE SCD AS-2-15.

SPECIAL - STRUCTURES: CONCRETE SPALL REMOVAL WITH ZINC RICH PRIMER APPLIED

THIS WORK WILL CONSIST OF REMOVING ALL VISIBLY SPALLED AREAS OF THE UNDERSIDE OF THE DECK WITHOUT SOUNDING.

AFTER SPALLED CONCRETE IS REMOVED THE EXISTING EXPOSED REINFORCING STEEL SHALL BE BLAST CLEANED. ACCEPTABLE METHODS INCLUDE HIGH PRESSURE WATER BLASTING WITH OR WITHOUT ABRASIVES IN THE WATER, ABRASIVES WITH CONTAINMENT, OR VACUUM BLASTING. APPLY A ZINC RICH PRIMER, PER CMS 708.02.B, OVER ALL EXPOSED STEEL SURFACES. THE APPLICATION OF THE PRIMER SHALL FOLLOW CMS 514 AND ALL MANUFACTURER REQUIREMENTS.

THE DEPARTMENT WILL MEASURE THIS WORK AS THE ACTUAL AREA IN SQUARE YARDS OF CONCRETE SPALLS REMOVED.

CONCRETE SPALL REMOVAL WILL BE PAID AT THE UNIT BID PRICE FOR SPECIAL – STRUCTURE MISC.: CONCRETE SPALL REMOVAL WITH ZINC PRICH PRIMER APPLIED. THIS PRICE WILL INCLUDE THE COST OF LABOR, EQUIPMENT, AND ALL INCIDENTALS REQUIRED TO COMPLETE THIS WORK.

SPALL REMOVAL ON STRUCTURES OVER TRAVEL LANES, PAVED SHOULDERS, AND PARKING LOTS

THE FOLLOWING WORK AND QUANTITIES SHALL BE USED ON THIS STRUCTURE TO REPAIR THE CONCRETE SPALLS OVER TRAVEL LANES, PAVED SHOULDERS, AND PARKING LOTS:


SUM-261D-0.664:
ITEM SPECIAL - STRUCTURES: CONCRETE SPALL REMOVAL WITH ZINC RICH PRIMER APPLIED, 80 SY
ITEM 512 – SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), 80 SY

SUM-261-10.237R:
ITEM SPECIAL - STRUCTURES: CONCRETE SPALL REMOVAL WITH ZINC RICH PRIMER APPLIED, 100 SY
ITEM 512 – SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), 100 SY

SFN	
VARIOUS	
DESIGN AGENCY	
DESIGNER	CHECKER
JF	MJA
REVIEWER	
TJP 01-03-25	
PROJECT ID	
122367	
SUBSET	TOTAL
1	23
SHEET	TOTAL
P.6	28

ITEM 516 - JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN

THIS WORK CONSISTS OF RAISING OR RE-POSITIONING EXISTING STRUCTURES TO THE DIMENSIONS AND REQUIREMENTS DEFINED IN THE PROJECT PLANS. SUBMIT CONSTRUCTION PLANS IN ACCORDANCE WITH C&MS 501.05. IF, DURING THE JACKING OPERATIONS, CRACKING OF THE CONCRETE SUPERSTRUCTURE, SEPARATION OF THE CONCRETE DECK FROM THE STEEL STRINGERS, OR OTHER DAMAGE TO THE STRUCTURE IS VISUALLY OBSERVED, IMMEDIATELY CEASE THE JACKING OPERATION AND INSTALL SUPPORTS TO THE SATISFACTION OF THE ENGINEER. ANALYZE THE DAMAGE AND SUBMIT A METHOD OF CORRECTION TO THE ENGINEER FOR APPROVAL. EPOXY INJECT ALL BEAMS THAT SEPARATE FROM THE DECK FOR A DISTANCE OF THE SEPARATION IN ACCORDANCE WITH C&MS 512.07. THE DEPARTMENT WILL NOT PAY FOR THE COST OF THIS EPOXY INJECTION OR OTHER REQUIRED REPAIRS. THE BRIDGE BEARINGS SHALL BE FULLY SEATED ALL CONTACT AREAS. IF FULL SEATING IS NOT ATTAINED, SUBMIT A REPAIR PLAN TO THE ENGINEER. THE DEPARTMENT WILL NOT PAY FOR THE REPAIR COSTS TO ENSURE FULL SEATING ON BEARINGS. THE DEPARTMENT WILL MEASURE THIS WORK ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES AT THE CONTRACT PRICE FOR ITEM 516, JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN.

SFN	
VARIOUS	
DESIGN AGENCY	
	
DESIGNER	CHECKER
JF	MJA
REVIEWER	
TJP	01-03-25
PROJECT ID	
122367	
SUBSET	TOTAL
2A	23
SHEET	TOTAL
P.7A	28

STRUCTURE NOTES
SUM-261D-0.664 & SUM-261-10.237R
OVER LITTLE CUYAHOGA RIVER & WE&MRTA RAILROADS

CALC:	JF	DATE:	11/27/2024
CHECKED:	MJA	DATE:	11/27/2024

ESTIMATED QUANTITIES												
BRIDGE NO. / STRUCTURE FILE NO.								ITEM	EXTENSION	UNIT	DESCRIPTION	SEE SHEET
SUM-261D-0.664 7708645 01/NHS/47	SUM-261-10.237R 7708653 01/NHS/47											
LS	LS							201	11001		CLEARING AND GRUBBING, AS PER PLAN, AROUND BRIDGES/STRUCTURES/CULVERTS	1 / 23
4841	4951							202	75001	FT	FENCE REMOVED, AS PER PLAN	13 / 23
6777	5498							512	10100	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
6685	5392							512	74000	SY	REMOVAL OF EXISTING COATINGS FROM CONCRETE SURFACES	
10381	10344							514	00050	SF	SURFACE PREPARATION OF EXISTING STRUCTURAL STEEL	
10381	10344							514	00056	SF	FIELD PAINTING OF EXISTING STRUCTURAL STEEL, PRIME COAT	
10381	10344							514	00060	SF	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	
10381	10344							514	00066	SF	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	
3	3							514	10000	EACH	FINAL INSPECTION REPAIR	
8	8							514	00504	MNHR	GRINDING FINS, TEARS, SLIVERS ON EXISTING STRUCTURAL STEEL	
LS	LS							516	47001		JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN	2A / 23
166	172							516	10010	FT	ARMORLESS PREFORMED JOINT SEAL	
100	50							519	11101	SF	PATCHING CONCRETE STRUCTURE, AS PER PLAN	1 / 23
59	66							519	12304	SY	PATCHING CONCRETE BRIDGE DECK - TYPE C	
12	12							SPECIAL	53000400	EACH	STRUCTURES: REFURBISHING AND LUBRICATING STEEL HINGES	1 / 23
35	35							SPECIAL	53000500	HOURL	STRUCTURES: SALT REMEDIATION FOR STRUCTURAL STEEL PAINTING	1 / 23
80	100							SPECIAL	53000800	SY	STRUCTURES: CONCRETE SPALL REMOVAL WITH ZINC RICH PRIMER APPLIED	1 / 23
5670	2555							SPECIAL	53000800	SY	STRUCTURES: STRUCTURAL DEBRIS NETTING INSTALLATION	2 / 23
	32							847	10001	SY	MICRO SILICA MODIFIED CONCRETE OVERLAY, AS PER PLAN (T=2 1/4")	2 / 23
	1							847	20001	CY	MICRO SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS), MATERIAL ONLY, AS PER PLAN	2 / 23
	LS							847	30000		TEST SLAB	2 / 23
	1							847	30201	CY	FULL DEPTH REPAIR, AS PER PLAN	
	32							847	30401	SY	EXISTING CONCRETE OVERLAY REMOVED, AS PER PLAN (T=2")	
	2							847	50000	SY	HAND CHIPPING	2 / 23
2	2							630	80100	SF	SIGN, FLAT SHEET, 730.20	
2	2							630	84900	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	
											ALTERNATES	
4841	4951							607	98000	FT	FENCE, MISC.: VANDAL PROTECTION FENCE, 7.50' STRAIGHT, COATED FABRIC (ALTERNATE 1)	13 / 23
4841	4951							607	39900	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC (ALTERNATE 2)	

ESTIMATED QUANTITIES

SUM-261D-0.664 & SUM-261-10.237R

OVER LITTLE CUYAHOGA RIVER & WE&MRTA RAILROADS

SFN	7708645
SFN	7708653
DESIGN AGENCY	



DESIGNER	CHECKER
JF	MJA
REVIEWER	
TJP	01-03-25
PROJECT ID	
122367	
SUBSET	TOTAL
3	23
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P.8	28