

GENERAL NOTES FOR CAST-IN-PLACE (CIP) RETAINING WALLS

APPLICABLE CODES AND STANDARDS
ALL REFERENCED CODES, SPECIFICATIONS AND STANDARDS SHALL BE THE MOST CURRENT EDITION.

JOB SITE SAFETY
JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH OSHA REQUIREMENTS.

DEVIATIONS FROM SITE PLAN
THESE DRAWINGS ARE BASED UPON SITE PLANS PERFORMED BY WOLVERTON & ASSOCIATES, INC. CHANGES TO THE SITE PLANS, INCLUDING GRADING, UTILITIES, STORM WATER CONTROL, AND BUILDINGS, MAY IMPACT WALL DESIGN REQUIREMENTS. WALL DESIGNER SHALL BE NOTIFIED OF ANY CHANGES TO OR DEVIATIONS FROM THE ABOVE REFERENCED SITE PLAN SO AN ASSESSMENT OF WALL DESIGN REQUIREMENTS CAN BE MADE.

PRE-CONSTRUCTION MEETING
THE GENERAL CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING THAT SHALL BE ATTENDED BY THE WALL DESIGN ENGINEER, THE WALL CONTRACTOR, THE GRADING CONTRACTOR, AND THE INSPECTION ENGINEER. THE GENERAL CONTRACTOR SHALL PROVIDE AT LEAST 10 DAYS NOTICE OF THE MEETING DATE.

INSPECTION AND TESTING AGENCY
IN ACCORDANCE WITH WAL-MART SPECIFICATIONS THE OWNER'S CONSTRUCTION TESTING LABORATORY (CTL) SHALL CONDUCT QUALITY CONTROL TESTS AND INSPECTIONS IN ACCORDANCE WITH WAL-MART SPECIFICATIONS.

CTL INSPECTION ENGINEER
THE CTL INSPECTION ENGINEER IS RESPONSIBLE FOR READING AND UNDERSTANDING THESE DRAWINGS AND SPECIFICATIONS. HE SHALL BE IN POSSESSION OF A COMPLETE SET OF THESE DRAWINGS WHEN PERFORMING INSPECTION DUTIES ON SITE. THE INSPECTION ENGINEER SHALL INSPECT CONSTRUCTION OF THE WALL FOR CONFORMANCE TO THE WALL PLANS, WAL-MART SPECIFICATIONS AND THESE CONSTRUCTION REQUIREMENTS. INSPECTION SHALL BE PERFORMED BY AN INDIVIDUAL EXPERIENCED WITH WALL CONSTRUCTION, AND IN ACCORDANCE WITH WAL-MART SPECIFICATIONS. INSPECTION SHALL INCLUDE CONCRETE TESTING, SOIL EVALUATION, EACH LIFT OF FILL PLACEMENT AND COMPACTION. THE INSPECTION ENGINEER SHALL CONTACT WALL DESIGNER IF ANY ASPECT OF THESE CONSTRUCTION DRAWINGS ARE UNCLEAR.

WALL INSPECTION
THE CTL INSPECTION ENGINEER SHALL INSPECT THE CONDITION OF THE FOUNDATION SOIL AND FOOTING FOR CONFORMANCE WITH THE PLANS PRIOR TO POURING THE FOOTING.

MATERIALS:

STRUCTURAL FILL SOIL
SOIL INSTALLED WITHIN THE STRUCTURAL FILL SOIL ZONE (SEE CONSTRUCTION DETAILS) SHALL BE FREE OF HIGH PLASTIC CLAY (CH), MUCK, WOODS, ROOTS, FROZEN MATERIAL, AND CONSTRUCTION DEBRIS.

STRUCTURAL FILL SOIL SHALL SATISFY THE FOLLOWING CRITERIA:

GRAIN SIZE DISTRIBUTION	
US STANDARD SIEVE SIZE	PERCENT PASSING
3 INCH	100
NO. 40	0-60
NO. 200	0-15

FOUNDATION SOIL
SOIL LOCATED IN THE FOUNDATION SOIL ZONE AT WALL A IS ASSUMED TO EXHIBIT THE MINIMUM EFFECTIVE INTERNAL ANGLE OF FRICTION INDICATED IN THE DESIGN PARAMETERS. IF FOUNDATION SOIL FAILS TO EXHIBIT THIS EFFECTIVE SHEAR STRENGTH, THE CONTRACTOR STOP WORK AND NOTIFY THE WALL DESIGNER.

ALLOWABLE BEARING PRESSURE
SOIL LOCATED IN THE FOUNDATION SOIL ZONE SHALL EXHIBIT A MINIMUM NET ALLOWABLE BEARING PRESSURE INDICATED IN THE DESIGN PARAMETERS. IF FOUNDATION SOIL FAILS TO EXHIBIT THIS EFFECTIVE BEARING PRESSURE, THE CONTRACTOR STOP WORK AND NOTIFY THE WALL DESIGNER.

RETAINED SOIL
SOIL LOCATED BEHIND THE STRUCTURAL FILL SOIL IS ASSUMED TO EXHIBIT A MINIMUM EFFECTIVE INTERNAL ANGLE OF FRICTION INDICATED IN THE DESIGN PARAMETERS. IF RETAINED SOIL FAILS TO EXHIBIT THIS EFFECTIVE SHEAR STRENGTH, STOP WORK AND NOTIFY WALL DESIGNER.

DRAINAGE AGGREGATE
DRAINAGE AGGREGATE SHALL BE MODOT GRADE 2 OR 5 DRAINAGE AGGREGATE CRUSHED STONE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

GEOTEXTILE FILTER
GEOTEXTILE FILTER SHALL COMPRISE A NON-WOVEN POLYPROPYLENE MATERIAL WHICH SATISFIES AASHTO M288-00 CRITERIA FOR CLASS 2 SURVIVABILITY, EXHIBITS A MINIMUM AVERAGE ROLL VALUE OF PERMITTIVITY OF 0.2 PER SEC, AND A MAXIMUM AVERAGE ROLL VALUE OF APPARENT OPENING SIZE OF 0.25mm. PRE APPROVED GEOTEXTILES INCLUDE AMOCO 455I, MIRAFI160N, AND SYNTHETIC INDUSTRIES GEOTEX 60I.

DRAIN PIPE
DRAIN PIPE SHALL COMPRISE A 4 INCH DIAMETER SLOTTED HDPE OR PVC PIPE. SEE WAL-MART SPECIFICATION 02830 SECTION 2.5 FOR DETAILS.

ACCESS LADDER
ACCESS LADDER SHALL BE GALVANIZED STEEL, BE RESTRICTED ACCESS AND IN COMPLIANCE WITH OSHA REGULATIONS. LADDER TO HAVE SAFETY CAGE EXTENDING TO 10' ABOVE FINISHED GRADE AT FRONT FACE OF WALL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT AND WALL DESIGNER FOR APPROVAL PRIOR TO CONSTRUCTION. SEE WALL ELEVATION FOR LOCATION.

CONCRETE

CONCRETE UNIT WEIGHT AND STRENGTH
ALL CONCRETE SHALL BE NORMAL WEIGHT AND EXHIBIT A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS (CLASS B-I).

MIX DESIGN
REFER TO MODOT STANDARD 50I.3 FOR CONCRETE MIX DESIGN.

REINFORCING STEEL
DEFORMED REINFORCING BARS SHALL BE GRADE 60 AND CONFORM TO ASTM A 615.

WATERSTOP
WATERSTOPS AT EXPANSION JOINTS SHALL COMPRISE 9 INCH RIBBED PVC WITH A 1" CENTER BULB OR A PRE-FORMED PLASTIC SEALING TYPE WATERSTOP. WATERSTOPS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PVC WATERSTOPS SHALL BE SPLICED USING FUSION TECHNIQUES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SEALANT
SEALANT AT JOINTS SHALL COMPRISE A LOW-MODULUS, HIGH PERFORMANCE, TWO PART POLYSULFIDE, NON-SAG, ELASTOMERIC MATERIAL WHICH IS SUITABLE FOR USE IN WATER IMMERSION APPLICATIONS. APPROVED PRODUCTS ARE CHEM-CAULK 400 AS MANUFACTURED BY BOSTIC CONSTRUCTION PRODUCTS DIVISION AND SONNEBORN SONOLASTIC SEALANT AS MANUFACTURED BY CHEMREX, INC. SEALANT SHALL BE RED IN COLOR. SEALANT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WATERPROOFING
ALL CONCRETE WATERPROOFING MATERIALS AND PRACTICES SHALL CONFORM WITH MISSOURI DEPARTMENT OF TRANSPORTATION STANDARDS SECTION 709.

FORM LINER
USE ASHLAR-BLOCK STYLE FORM LINER. CONTRACTOR TO SUBMIT SAMPLE TO SITE ARCHITECT AND WALL DESIGNER FOR APPROVAL.

CONCRETE STAIN
USE A TAN-COLORED CONCRETE STAIN ON ALL EXPOSED SURFACES. CONTRACTOR TO SUBMIT COLOR TO SITE ARCHITECT AND WALL DESIGNER FOR APPROVAL.

WALL ERECTION:

FOOTING EXCAVATION
EXCAVATION FOR THE WALL FOOTING SHALL BE NEAT AND FREE OF LOOSE MATERIAL AND DEBRIS BEFORE PLACEMENT OF CONCRETE. WATER WHICH ACCUMULATES IN EXCESS OF 1" SHALL BE REMOVED BEFORE PLACEMENT OF CONCRETE. CONCRETE KEY SHALL BE CAST AGAINST UNFORMED, UNDISTURBED EARTH.

CONCRETE
CONCRETE CONSTRUCTION, INCLUDING MINIMUM COVERAGE OF REINFORCING STEEL, SHALL CONFORM TO ACI 318-02 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL USE A TREMIE TO PLACE CONCRETE IN ALL AREAS WHERE THE FALL OF THE CONCRETE WOULD OTHERWISE EXCEED 5 FEET. CONCRETE SHALL BE VIBRATED TO ASSURE PROPER DENSITY, ELIMINATION OF VOIDS, AND TO MINIMIZE SURFACE DEFECTS.

CHAMFER
ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4".

REINFORCING STEEL
DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS SHALL CONFORM TO ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING OF REINFORCED CONCRETE STRUCTURES". PROVIDE SUPPORTS OR CHAIRS TO SUPPORT REINFORCING STEEL AT THE POSITIONS REQUIRED BY THESE DRAWINGS. STEEL REINFORCING IN FOOTINGS SHALL BE SUPPORTED ON PRE-CAST CONCRETE BLOCKS THAT HAVE A THICKNESS WHICH ALLOWS PROPER POSITIONING OF THE REINFORCING STEEL. BLOCKS SHALL BE SPACED NO FARTHER APART THAN 3'-0" O.C. LAP CONTINUOUS UNSCHEDULED REINFORCING BARS 48 BAR DIAMETERS UNLESS NOTED OTHERWISE. UNLESS NOTED OTHERWISE, ALL 90, 135, AND 180 DEGREE REINFORCING STEEL HOOKS SHALL BE STANDARD ACHOOKS. FIELD CUTTING OF REINFORCING STEEL SHALL BE BY SAW. USE OF CUTTING TORCHES IS NOT PERMITTED.

JOINTS
EXPANSION JOINTS SHALL BE SPACED NO MORE THAN 100'. CONTROL JOINTS SHALL BE SPACED NO MORE THAN 25'. VERTICAL CONSTRUCTION JOINTS SHALL NOT BE LOCATED WITHIN 10' OF A CONTROL JOINT. A VERTICAL CONSTRUCTION JOINT MAY REPLACE A CONTROL JOINT. HORIZONTAL CONSTRUCTION JOINTS ARE NOT PERMITTED.

CONCRETE FORMS
FORMS FOR SURFACES WHICH WILL BE EXPOSED TO VIEW IN THE FINISHED CONSTRUCTION SHALL BE FREE OF RAISED GRAIN, TORN SURFACES, WORN EDGES, PATCHES, DENTS, OR OTHER DEFECTS. THE STRENGTH OF FORMS SHALL BE SUCH THAT NO BULGING, WARPING, OR BOWING OCCUR UNDER THE WEIGHT OF THE WET CONCRETE. FORM JOINTS SHALL BE SMOOTH AND MORTAR TIGHT. FORMS WHICH DO NOT PRESENT A SMOOTH SURFACE OR WHICH DO NOT PROPERLY ALIGN SHALL NOT BE USED. FORMS SHALL BE FREE OF RUST, GREASE, AND OTHER MATERIALS THAT MAY DISCOLOR THE FINISHED CONCRETE. FORMS SHALL REMAIN IN PLACE A MINIMUM OF 7 DAYS.

FORM TIES
FORM TIES SHALL BE FABRICATED SUCH THAT THE ENDS OR END FASTENERS CAN BE REMOVED WITHOUT CAUSING SPALLING AT CONCRETE FACE. FORM TIES SHALL BE PROVIDED WITH A WATER SEAL FEATURE. REMOVE THE END OF FORM TIES SUCH THAT THE EMBEDDED PORTION OF THE TIE IS LOCATED AT LEAST 3/4" FROM THE FORMED CONCRETE FACE.

BACKFILLING
STRUCTURAL FILL SOIL AND DRAINAGE AGGREGATE SHALL BE INSTALLED NO EARLIER THAN 7 DAYS FOLLOWING INSTALLATION OF CONCRETE. STRUCTURAL FILL SOIL SHALL BE COMPACTED TO WITHIN 95 PERCENT OF ITS MAXIMUM DRY DENSITY AS MEASURED IN ACCORDANCE WITH ASTM D 698 (STANDARD PROCTOR EFFORT) AND WITHIN 2 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. STRUCTURAL FILL SOIL SHALL BE INSTALLED IN A COMPACTED LIFT THICKNESS NO GREATER THAN 8" AT DISTANCES GREATER THAN 3' FROM THE BACK OF THE RETAINING WALL. STRUCTURAL FILL SOIL SHALL BE INSTALLED IN A COMPACTED LIFT THICKNESS NO GREATER THAN 6" AT DISTANCES LESS THAN 3' FROM THE BACK OF THE RETAINING WALL. WITHIN 3' OF THE BACK OF THE RETAINING WALL, COMPACTION EQUIPMENT SHALL BE LIMITED TO LIGHT DUTY VIBRATORY SLED.

DRAINAGE

DRAINAGE AGGREGATE, DRAIN PIPE, WEEP HOLES, AND GEOTEXTILE FILTER SHALL BE INSTALLED AS SHOWN IN THE CONSTRUCTION DETAILS. THE CONTRACTOR SHALL PREVENT THE FLOW OF SURFACE WATER TOWARDS THE RETAINING WALL BY THE USE OF BERMS, DIVERSION DITCHES AND ALL OTHER MEANS THAT ARE REQUIRED UNTIL WALL CONSTRUCTION IS COMPLETE.

CONCRETE FINISHING:

SURFACE DEFECTS

DEFECTIVE AREAS, INCLUDING FORM TIE HOLES, SHALL BE REPAIRED IMMEDIATELY AFTER REMOVAL OF FORMS. HONEY COMBED AND OTHER SURFACE DEFECTS SHALL BE REMOVED SUCH THAT SOUND CONCRETE IS EXPOSED. THE DEFECTIVE AND ADJACENT AREA SHALL BE DAMPENED AND A BONDING GROUT APPLIED. BONDING GROUT SHALL COMPRISE APPROXIMATELY ONE PART CEMENT TO ONE PART FINE SAND (PASSING NO. 30 US STANDARD SIEVE), MIX GROUT TO CONSISTENCY OF A THICK CREAM AND BRUSH THOROUGHLY INTO THE SURFACE VOID.

PATCHING MORTAR
PATCHING MORTAR SHALL COMPRISE THE SAME MIXTURE AS THE CONCRETE BUT WITHOUT COARSE AGGREGATE. MIX MORTAR WITH NO MORE THAN ONE PART CEMENT TO 2 1/2 PARTS SAND. AFTER SURFACE WATER FROM THE BONDING AGENT HAS DRIED, THOROUGHLY BRUSH PATCHING MORTAR ONTO THE BONDING GROUT.

CONCRETE TESTING:

GENERAL

IN THE EVENT INSTALLED CONCRETE DOES NOT SATISFY THESE REQUIREMENTS, THE WALL DESIGNER, AT HIS SOLE DISCRETION AND AT THE CONTRACTOR'S EXPENSE, MAY REQUIRE ADDITIONAL ANALYSIS, TESTING, REMOVAL, AND REPLACEMENT OF CONCRETE MEMBERS. SAMPLES FOR TESTING SHALL BE COLLECTED IN ACCORDANCE WITH ASTM C 172 "STANDARD PRACTICE FOR SAMPLING FRESHLY MIXED CONCRETE". THE WALL LOCATION WHERE THE SAMPLED CONCRETE IS POURED SHALL BE RECORDED. FOUR SAMPLES FOR TESTING SHALL BE COLLECTED NOT LESS THAN ONCE PER DAY NOR LESS THAN ONCE FOR EACH 50 CUBIC YARDS OF CONCRETE.

STRENGTH TESTING

STRENGTH TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C 39 "STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS". STRENGTH TESTING SPECIMENS SHALL BE MOLDED AND LABORATORY CURED IN ACCORDANCE WITH ASTM C 31 "STANDARD PRACTICE FOR MAKING AND CURING CONCRETE TEST SPECIMENS IN THE FIELD". STRENGTH TESTING SHALL BE PERFORMED ON ONE SPECIMEN AT 7 DAYS AND TWO SPECIMENS AT 28 DAYS. THE FOURTH SPECIMEN SHALL BE RETAINED FOR 56 DAYS AND TESTED ONLY IF THE AVERAGE STRENGTH OF THE 28 DAY TESTS DO NOT MEET THE REQUIRED MINIMUM COMPRESSIVE STRENGTH.

SLUMP TESTING

SLUMP TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C 143 "STANDARD TEST METHOD FOR SLUMP OF HYDRAULIC CEMENT CONCRETE". SLUMP TESTING SHALL BE PERFORMED FOR EACH SAMPLE.

TEMPERATURE TESTING

TEMPERATURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C 1064 "TEST METHOD FOR TEMPERATURE OF FRESHLY MIXED PORTLAND CEMENT CONCRETE". TEMPERATURE TESTING SHALL BE PERFORMED FOR EACH SAMPLE.

STRUCTURAL FILL SOIL

THE DENSITY AND WATER CONTENT OF STRUCTURAL FILL SOIL SHALL BE INSPECTED AT THE FOLLOWING FREQUENCY:

AT LEAST ONCE PER EVERY 1000 SQUARE FEET PER 8 INCH THICK LIFT IN PLAN AREA.

AT LEAST ONCE PER EVERY THREE 8 INCH THICK CONSECUTIVE LIFTS (I.E. EVERY 2 VERTICAL FEET).

THE INSPECTOR SHALL RECORD THE IN-SITU DRY UNIT WEIGHT, THE REQUIRED MINIMUM DRY UNIT WEIGHT, THE MOISTURE CONTENT, THE OPTIMUM MOISTURE CONTENT, THE TEST LOCATION AND ELEVATION, AND THE USGS CLASSIFICATION BASED ON VISUAL INSPECTION.

DESIGN PARAMETERS:

SPECIFICATIONS ----- AASHTO STANDARD SPECIFICATIONS, 17TH EDITION.

MINIMUM FACTORS OF SAFETY

FS SLIDING -----	1.5
FS OVERTURNING -----	2.0
FS GLOBAL -----	1.3

SOIL PARAMETERS

ZONE	MINIMUM EFFECTIVE ANGLE OF FRICTION	UNIT WEIGHT	REQUIRED BEARING CAPACITY
FOUNDATION SOIL	26 DEGREES	120 PCF	3000 PSF
RETAINED SOIL	26 DEGREES	120 PCF	-----
STRUCTURAL FILL SOIL	26 DEGREES*	120 PCF	-----

COEFFICIENT OF SLIDING FRICTION --- 0.49 * WITHIN 3% STRAIN

SEISMIC PARAMETERS ---- SEISMIC CATEGORY "C". HORIZONTAL ACCELERATION = 0.12G.

GEOTECHNICAL SITE INVESTIGATION REPORT
THE GENERAL CONTRACTOR, WALL CONTRACTOR AND CTL INSPECTION ENGINEER SHALL READ THE FOLLOWING REPORT(S) OF GEOTECHNICAL SITE INVESTIGATION:

GEOTECHNICAL EXPLORATION, MTJOB NO. 11216 DATED MAY 9, 2008 PERFORMED BY MIDWEST TESTING.

ANY ADDITIONAL GEOTECHNICAL AND CONSTRUCTION REQUIREMENTS ARE NOTED ON THE INDIVIDUAL WALL DRAWINGS.



DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
MKL	MKL	05/15/08	MKL	MKL	05/15/08
CHECKED BY	CGC	05/15/08	CHECKED BY	CGC	05/15/08

SUPERVISED BY GREG C. GRANT, P.E.

WAL-MART #2616-04
O'FALLON, MISSOURI
BY: WAL-MART STORES EAST, INC.
BENTONVILLE, AR. 72716

RETAINING WALL No. 2 (CIP)
GENERAL NOTES

DRAWING NUMBER
RW-4

(C) HMA & MEXICO
 WOLVERTON & ASSOCIATES
 EXPANSION

