



Christian Brothers Automotive

2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel

In 2007, at the same date we started this project, January 2, the temperature was 79° in Jackson, Tennessee. This year, January 2010, the headlines scream daily about the cold temperature records being set. On January 6th, the temperature actually dropped to 0° at one point, with wind chill factors much lower. Obviously, this is causing construction delays (only part of which is the subcontract for the floor). As of January 7th, we are on schedule (with just slight delays) and anticipate having the floor completed and open for heavy traffic the week of January 11th. The photographs below show the conditions and the application procedures from the project start and through the third application of epoxy (E31-1204, E31-1202) / urethane (U31-1201) and will be updated daily.



Conditions at Project Start - January 2, 2010





Christian Brothers Automotive

2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel



Hand grinding/beveling of floor drain



Diamond grinding / profiling floor - 1/3/10, 1/4/10 and 1/5/10



Christian Brothers Automotive

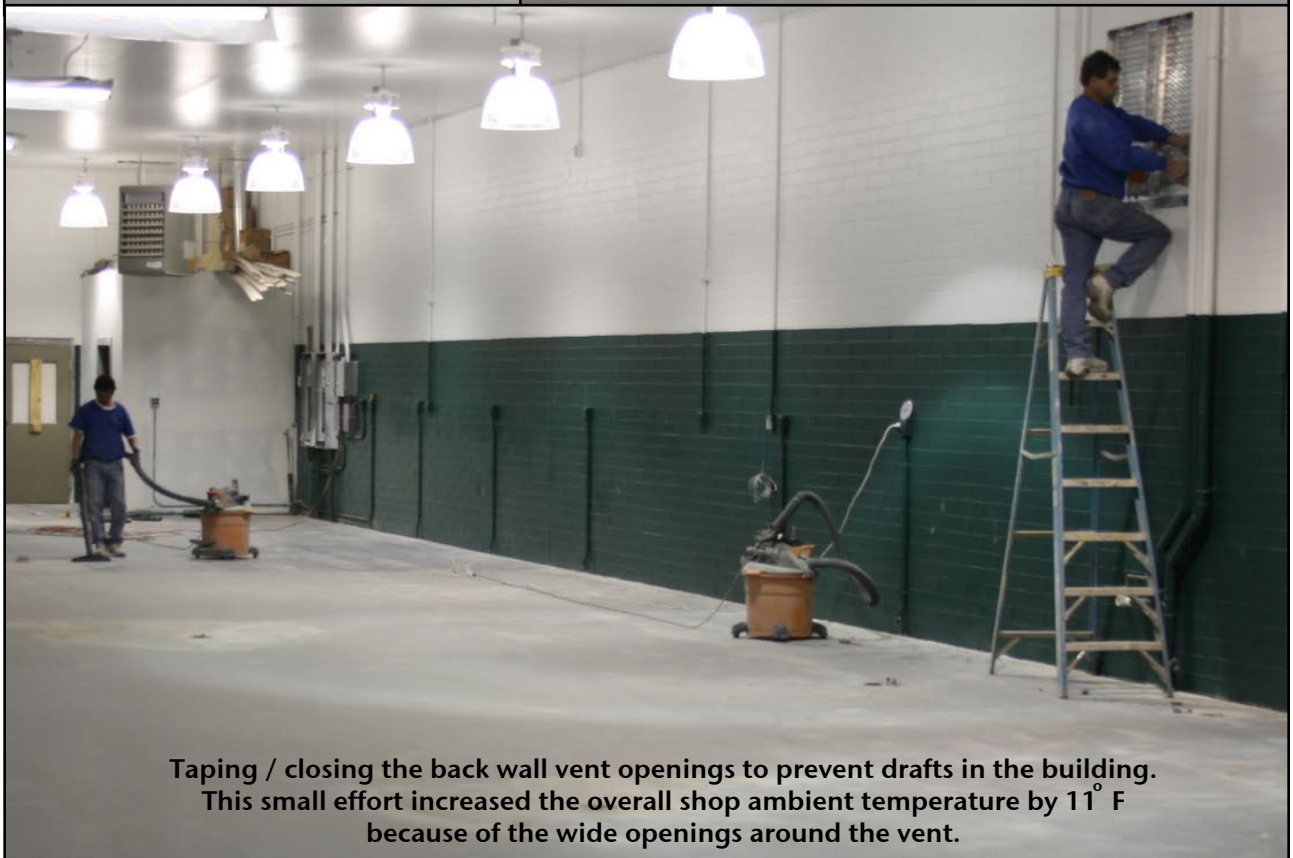
2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel



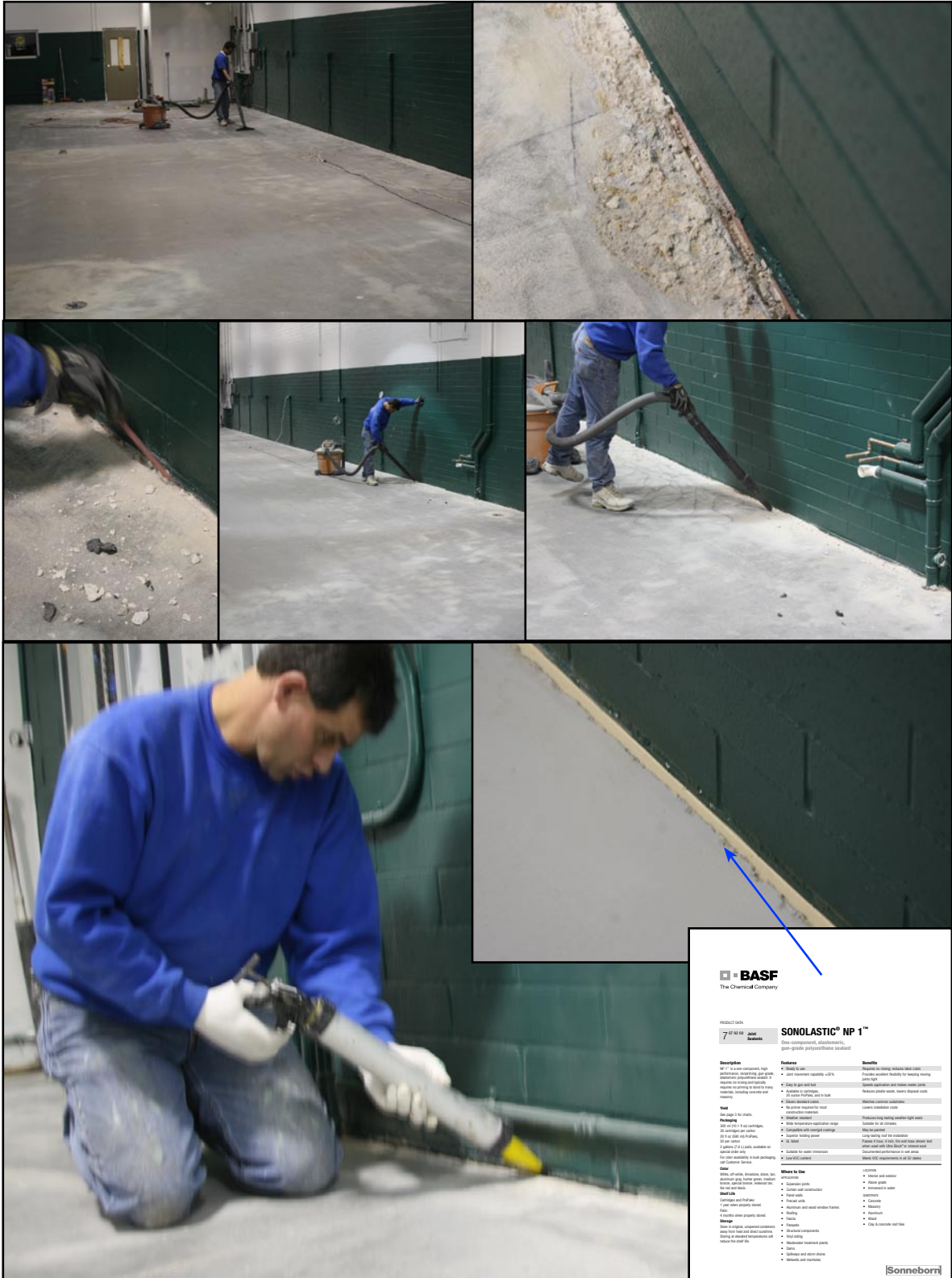
Heating front door lips to warm concrete prior to application of E31-1202-64 concrete primer.



Taping / closing the back wall vent openings to prevent drafts in the building. This small effort increased the overall shop ambient temperature by 11° F because of the wide openings around the vent.



Christian Brothers Automotive
2700 Highland Ave.
Jackson, Tennessee 38305
Owners: Wes and Claire Pennel



BASF
The Chemical Company

SONOLASTIC® NP 1*
One-component, self-healing,
gap-graft polyurethane sealant

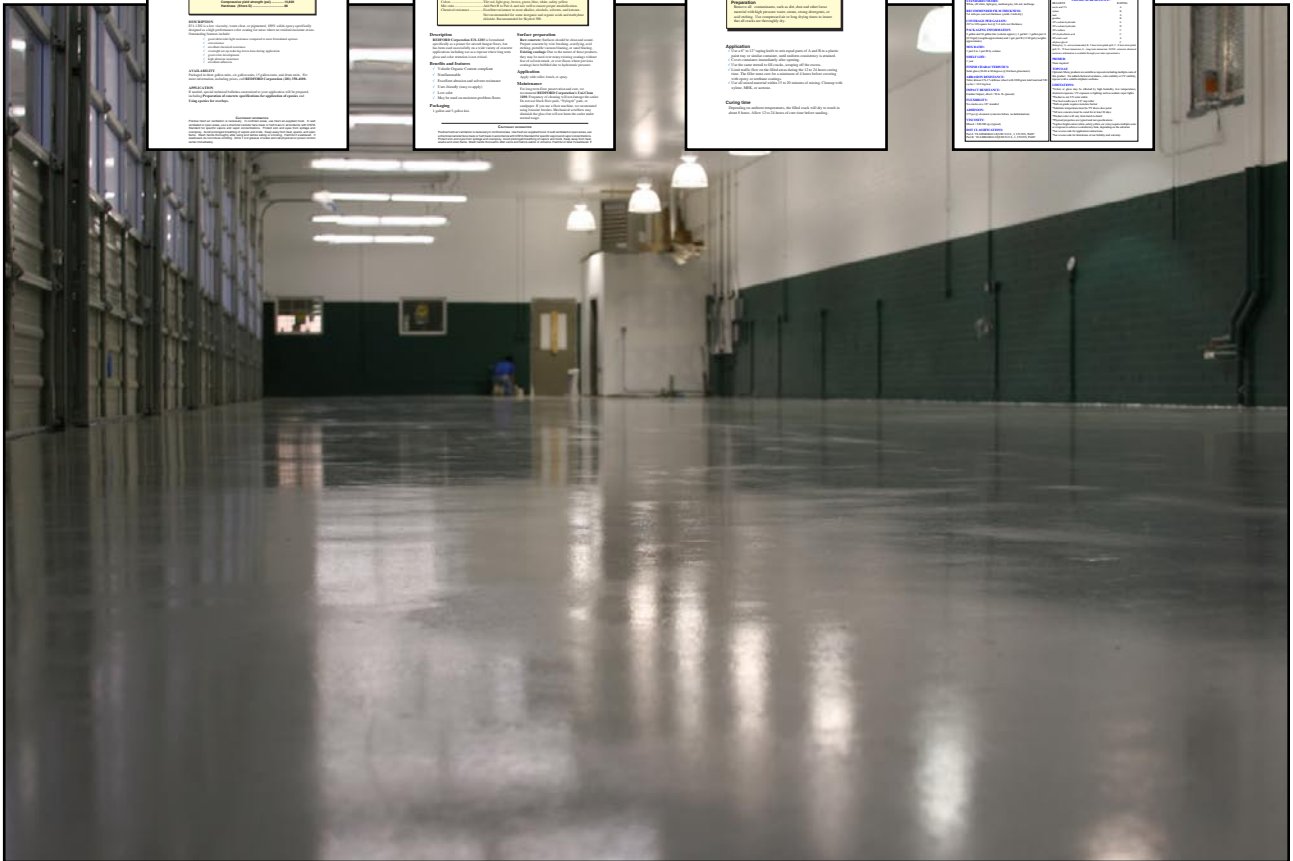
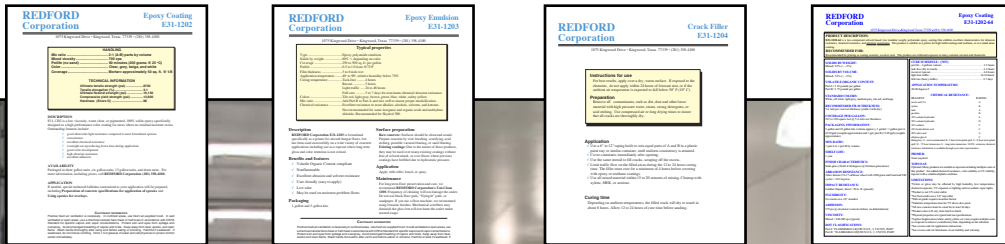
Description	Features	Benefits
<ul style="list-style-type: none"> • 100% solids, non-solvent, high adhesion, self-healing, gap-graft polyurethane sealant • Available in 10, 20, 30, 45, 60, 75, 90, 105, 120, 150, 180, 210, 240, 300, 360, 420, 480, 540, 600, 660, 720, 780, 840, 900, 960, 1020, 1080, 1140, 1200, 1260, 1320, 1380, 1440, 1500, 1560, 1620, 1680, 1740, 1800, 1860, 1920, 1980, 2040, 2100, 2160, 2220, 2280, 2340, 2400, 2460, 2520, 2580, 2640, 2700, 2760, 2820, 2880, 2940, 3000, 3060, 3120, 3180, 3240, 3300, 3360, 3420, 3480, 3540, 3600, 3660, 3720, 3780, 3840, 3900, 3960, 4020, 4080, 4140, 4200, 4260, 4320, 4380, 4440, 4500, 4560, 4620, 4680, 4740, 4800, 4860, 4920, 4980, 5040, 5100, 5160, 5220, 5280, 5340, 5400, 5460, 5520, 5580, 5640, 5700, 5760, 5820, 5880, 5940, 6000, 6060, 6120, 6180, 6240, 6300, 6360, 6420, 6480, 6540, 6600, 6660, 6720, 6780, 6840, 6900, 6960, 7020, 7080, 7140, 7200, 7260, 7320, 7380, 7440, 7500, 7560, 7620, 7680, 7740, 7800, 7860, 7920, 7980, 8040, 8100, 8160, 8220, 8280, 8340, 8400, 8460, 8520, 8580, 8640, 8700, 8760, 8820, 8880, 8940, 9000, 9060, 9120, 9180, 9240, 9300, 9360, 9420, 9480, 9540, 9600, 9660, 9720, 9780, 9840, 9900, 9960, 10020, 10080, 10140, 10200, 10260, 10320, 10380, 10440, 10500, 10560, 10620, 10680, 10740, 10800, 10860, 10920, 10980, 11040, 11100, 11160, 11220, 11280, 11340, 11400, 11460, 11520, 11580, 11640, 11700, 11760, 11820, 11880, 11940, 12000, 12060, 12120, 12180, 12240, 12300, 12360, 12420, 12480, 12540, 12600, 12660, 12720, 12780, 12840, 12900, 12960, 13020, 13080, 13140, 13200, 13260, 13320, 13380, 13440, 13500, 13560, 13620, 13680, 13740, 13800, 13860, 13920, 13980, 14040, 14100, 14160, 14220, 14280, 14340, 14400, 14460, 14520, 14580, 14640, 14700, 14760, 14820, 14880, 14940, 15000, 15060, 15120, 15180, 15240, 15300, 15360, 15420, 15480, 15540, 15600, 15660, 15720, 15780, 15840, 15900, 15960, 16020, 16080, 16140, 16200, 16260, 16320, 16380, 16440, 16500, 16560, 16620, 16680, 16740, 16800, 16860, 16920, 16980, 17040, 17100, 17160, 17220, 17280, 17340, 17400, 17460, 17520, 17580, 17640, 17700, 17760, 17820, 17880, 17940, 18000, 18060, 18120, 18180, 18240, 18300, 18360, 18420, 18480, 18540, 18600, 18660, 18720, 18780, 18840, 18900, 18960, 19020, 19080, 19140, 19200, 19260, 19320, 19380, 19440, 19500, 19560, 19620, 19680, 19740, 19800, 19860, 19920, 19980, 20040, 20100, 20160, 20220, 20280, 20340, 20400, 20460, 20520, 20580, 20640, 20700, 20760, 20820, 20880, 20940, 21000, 21060, 21120, 21180, 21240, 21300, 21360, 21420, 21480, 21540, 21600, 21660, 21720, 21780, 21840, 21900, 21960, 22020, 22080, 22140, 22200, 22260, 22320, 22380, 22440, 22500, 22560, 22620, 22680, 22740, 22800, 22860, 22920, 22980, 23040, 23100, 23160, 23220, 23280, 23340, 23400, 23460, 23520, 23580, 23640, 23700, 23760, 23820, 23880, 23940, 24000, 24060, 24120, 24180, 24240, 24300, 24360, 24420, 24480, 24540, 24600, 24660, 24720, 24780, 24840, 24900, 24960, 25020, 25080, 25140, 25200, 25260, 25320, 25380, 25440, 25500, 25560, 25620, 25680, 25740, 25800, 25860, 25920, 25980, 26040, 26100, 26160, 26220, 26280, 26340, 26400, 26460, 26520, 26580, 26640, 26700, 26760, 26820, 26880, 26940, 27000, 27060, 27120, 27180, 27240, 27300, 27360, 27420, 27480, 27540, 27600, 27660, 27720, 27780, 27840, 27900, 27960, 28020, 28080, 28140, 28200, 28260, 28320, 28380, 28440, 28500, 28560, 28620, 28680, 28740, 28800, 28860, 28920, 28980, 29040, 29100, 29160, 29220, 29280, 29340, 29400, 29460, 29520, 29580, 29640, 29700, 29760, 29820, 29880, 29940, 30000, 30060, 30120, 30180, 30240, 30300, 30360, 30420, 30480, 30540, 30600, 30660, 30720, 30780, 30840, 30900, 30960, 31020, 31080, 31140, 31200, 31260, 31320, 31380, 31440, 31500, 31560, 31620, 31680, 31740, 31800, 31860, 31920, 31980, 32040, 32100, 32160, 32220, 32280, 32340, 32400, 32460, 32520, 32580, 32640, 32700, 32760, 32820, 32880, 32940, 33000, 33060, 33120, 33180, 33240, 33300, 33360, 33420, 33480, 33540, 33600, 33660, 33720, 33780, 33840, 33900, 33960, 34020, 34080, 34140, 34200, 34260, 34320, 34380, 34440, 34500, 34560, 34620, 34680, 34740, 34800, 34860, 34920, 34980, 35040, 35100, 35160, 35220, 35280, 35340, 35400, 35460, 35520, 35580, 35640, 35700, 35760, 35820, 35880, 35940, 36000, 36060, 36120, 36180, 36240, 36300, 36360, 36420, 36480, 36540, 36600, 36660, 36720, 36780, 36840, 36900, 36960, 37020, 37080, 37140, 37200, 37260, 37320, 37380, 37440, 37500, 37560, 37620, 37680, 37740, 37800, 37860, 37920, 37980, 38040, 38100, 38160, 38220, 38280, 38340, 38400, 38460, 38520, 38580, 38640, 38700, 38760, 38820, 38880, 38940, 39000, 39060, 39120, 39180, 39240, 39300, 39360, 39420, 39480, 39540, 39600, 39660, 39720, 39780, 39840, 39900, 39960, 40020, 40080, 40140, 40200, 40260, 40320, 40380, 40440, 40500, 40560, 40620, 40680, 40740, 40800, 40860, 40920, 40980, 41040, 41100, 41160, 41220, 41280, 41340, 41400, 41460, 41520, 41580, 41640, 41700, 41760, 41820, 41880, 41940, 42000, 42060, 42120, 42180, 42240, 42300, 42360, 42420, 42480, 42540, 42600, 42660, 42720, 42780, 42840, 42900, 42960, 43020, 43080, 43140, 43200, 43260, 43320, 43380, 43440, 43500, 43560, 43620, 43680, 43740, 43800, 43860, 43920, 43980, 44040, 44100, 44160, 44220, 44280, 44340, 44400, 44460, 44520, 44580, 44640, 44700, 44760, 44820, 44880, 44940, 45000, 45060, 45120, 45180, 45240, 45300, 45360, 45420, 45480, 45540, 45600, 45660, 45720, 45780, 45840, 45900, 45960, 46020, 46080, 46140, 46200, 46260, 46320, 46380, 46440, 46500, 46560, 46620, 46680, 46740, 46800, 46860, 46920, 46980, 47040, 47100, 47160, 47220, 47280, 47340, 47400, 47460, 47520, 47580, 47640, 47700, 47760, 47820, 47880, 47940, 48000, 48060, 48120, 48180, 48240, 48300, 48360, 48420, 48480, 48540, 48600, 48660, 48720, 48780, 48840, 48900, 48960, 49020, 49080, 49140, 49200, 49260, 49320, 49380, 49440, 49500, 49560, 49620, 49680, 49740, 49800, 49860, 49920, 49980, 50040, 50100, 50160, 50220, 50280, 50340, 50400, 50460, 50520, 50580, 50640, 50700, 50760, 50820, 50880, 50940, 51000, 51060, 51120, 51180, 51240, 51300, 51360, 51420, 51480, 51540, 51600, 51660, 51720, 51780, 51840, 51900, 51960, 52020, 52080, 52140, 52200, 52260, 52320, 52380, 52440, 52500, 52560, 52620, 52680, 52740, 52800, 52860, 52920, 52980, 53040, 53100, 53160, 53220, 53280, 53340, 53400, 53460, 53520, 53580, 53640, 53700, 53760, 53820, 53880, 53940, 54000, 54060, 54120, 54180, 54240, 54300, 54360, 54420, 54480, 54540, 54600, 54660, 54720, 54780, 54840, 54900, 54960, 55020, 55080, 55140, 55200, 55260, 55320, 55380, 55440, 55500, 55560, 55620, 55680, 55740, 55800, 55860, 55920, 55980, 56040, 56100, 56160, 56220, 56280, 56340, 56400, 56460, 56520, 56580, 56640, 56700, 56760, 56820, 56880, 56940, 57000, 57060, 57120, 57180, 57240, 57300, 57360, 57420, 57480, 57540, 57600, 57660, 57720, 57780, 57840, 57900, 57960, 58020, 58080, 58140, 58200, 58260, 58320, 58380, 58440, 58500, 58560, 58620, 58680, 58740, 58800, 58860, 58920, 58980, 59040, 59100, 59160, 59220, 59280, 59340, 59400, 59460, 59520, 59580, 59640, 59700, 59760, 59820, 59880, 59940, 60000, 60060, 60120, 60180, 60240, 60300, 60360, 60420, 60480, 60540, 60600, 60660, 60720, 60780, 60840, 60900, 60960, 61020, 61080, 61140, 61200, 61260, 61320, 61380, 61440, 61500, 61560, 61620, 61680, 61740, 61800, 61860, 61920, 61980, 62040, 62100, 62160, 62220, 62280, 62340, 62400, 62460, 62520, 62580, 62640, 62700, 62760, 62820, 62880, 62940, 63000, 63060, 63120, 63180, 63240, 63300, 63360, 63420, 63480, 63540, 63600, 63660, 63720, 63780, 63840, 63900, 63960, 64020, 64080, 64140, 64200, 64260, 64320, 64380, 64440, 64500, 64560, 64620, 64680, 64740, 64800, 64860, 64920, 64980, 65040, 65100, 65160, 65220, 65280, 65340, 65400, 65460, 65520, 65580, 65640, 65700, 65760, 65820, 65880, 65940, 66000, 66060, 66120, 66180, 66240, 66300, 66360, 66420, 66480, 66540, 66600, 66660, 66720, 66780, 66840, 66900, 66960, 67020, 67080, 67140, 67200, 67260, 67320, 67380, 67440, 67500, 67560, 67620, 67680, 67740, 67800, 67860, 67920, 67980, 68040, 68100, 68160, 68220, 68280, 68340, 68400, 68460, 68520, 68580, 68640, 68700, 68760, 68820, 68880, 68940, 69000, 69060, 69120, 69180, 69240, 69300, 69360, 69420, 69480, 69540, 69600, 69660, 69720, 69780, 69840, 69900, 69960, 70020, 70080, 70140, 70200, 70260, 70320, 70380, 70440, 70500, 70560, 70620, 70680, 70740, 70800, 70860, 70920, 70980, 71040, 71100, 71160, 71220, 71280, 71340, 71400, 71460, 71520, 71580, 71640, 71700, 71760, 71820, 71880, 71940, 72000, 72060, 72120, 72180, 72240, 72300, 72360, 72420, 72480, 72540, 72600, 72660, 72720, 72780, 72840, 72900, 72960, 73020, 73080, 73140, 73200, 73260, 73320, 73380, 73440, 73500, 73560, 73620, 73680, 73740, 73800, 73860, 73920, 73980, 74040, 74100, 74160, 74220, 74280, 74340, 74400, 74460, 74520, 74580, 74640, 74700, 74760, 74820, 74880, 74940, 75000, 75060, 75120, 75180, 75240, 75300, 75360, 75420, 75480, 75540, 75600, 75660, 75720, 75780, 75840, 75900, 75960, 76020, 76080, 76140, 76200, 76260, 76320, 76380, 76440, 76500, 76560, 76620, 76680, 76740, 76800, 76860, 76920, 76980, 77040, 77100, 77160, 77220, 77280, 77340, 77400, 77460, 77520, 77580, 77640, 77700, 77760, 77820, 77880, 77940, 78000, 78060, 78120, 78180, 78240, 78300, 78360, 78420, 78480, 78540, 78600, 78660, 78720, 78780, 78840, 78900, 78960, 79020, 79080, 79140, 79200, 79260, 79320, 79380, 79440, 79500, 79560, 79620, 79680, 79740, 79800, 79860, 79920, 79980, 80040, 80100, 80160, 80220, 80280, 80340, 80400, 80460, 80520, 80580, 80640, 80700, 80760, 80820, 80880, 80940, 81000, 81060, 81120, 81180, 81240, 81300, 81360, 81420, 81480, 81540, 81600, 81660, 81720, 81780, 81840, 81900, 81960, 82020, 82080, 82140, 82200, 82260, 82320, 82380, 82440, 82500, 82560, 82620, 82680, 82740, 82800, 82860, 82920, 82980, 83040, 83100, 83160, 83220, 83280, 83340, 83400, 83460, 83520, 83580, 83640, 83700, 83760, 83820, 83880, 83940, 84000, 84060, 84120, 84180, 84240, 84300, 84360, 84420, 84480, 84540, 84600, 84660, 84720, 84780, 84840, 84900, 84960, 85020, 85080, 85140, 85200, 85260, 85320, 85380, 85440, 85500, 85560, 85620, 85680, 85740, 85800, 85860, 85920, 85980, 86040, 86100, 86160, 86220, 86280, 86340, 86400, 86460, 86520, 86580, 86640, 86700, 86760, 86820, 86880, 86940, 87000, 87060, 87120, 87180, 87240, 87300, 87360, 87420, 87480, 87540, 87600, 87660, 87720, 87780, 87840, 87900, 87960, 88020, 88080, 88140, 88200, 88260, 88320, 88380, 88440, 88500, 88560, 88620, 88680, 88740, 88800, 88860, 88920, 88980, 89040, 89100, 89160, 89220, 89280, 89340, 89400, 89460, 89520, 89580, 89640, 89700, 89760, 89820, 89880, 89940, 90000, 90060, 90120, 90180, 90240, 90300, 90360, 90420, 90480, 90540, 90600, 90660, 90720, 90780, 90840, 90900, 90960, 91020, 91080, 91140, 91200, 91260, 91320, 91380, 91440, 91500, 91560, 91620, 91680, 91740, 91800, 91860, 91920, 91980, 92040, 92100, 92160, 92220, 92280, 92340, 92400, 92460, 92520, 92580, 92640, 92700, 92760, 92820, 92880, 92940, 93000, 93060, 93120, 93180, 93240, 93300, 93360, 93420, 93480, 93540, 93600, 93660, 93720, 93780, 93840, 93900, 93960, 94020, 94080, 94140, 94200, 94260, 94320, 94380, 94440, 94500, 94560, 94620, 94680, 94740, 94800, 94860, 94920, 94980, 95040, 95100, 95160, 95220, 95280, 95340, 95400, 95460, 95520, 95580, 95640, 95700, 95760, 95820, 95880, 95940, 96000, 96060, 96120, 96180, 96240, 96300, 96360, 96420, 96480, 96540, 96600, 96660, 96720, 96780, 96840, 96900, 96960, 97020, 97080, 97140, 97200, 97260, 97320, 97380, 97440, 97500, 97560, 97620, 97680, 97740, 97800, 97860, 97920, 97980, 98040, 98100, 98160, 98220, 98280, 98340, 98400, 98460, 98520, 98580, 98640, 98700, 98760, 98820, 98880, 98940, 99000, 99060, 99120, 99180, 99240, 99300, 99360, 99420, 99480, 99540, 99600, 99660, 99720, 99780, 99840, 99900, 99960, 100020, 100080, 100140, 100200, 100260, 100320, 100380, 100440, 100500, 100560, 100620, 100680, 100740, 100800, 100860, 100920, 100980, 101040, 101100, 101160, 101220, 101280, 101340, 101400, 101460, 101520, 101580, 101640, 101700, 10		



Christian Brothers Automotive
2700 Highland Ave.
Jackson, Tennessee 38305
Owners: Wes and Claire Pennel



The concrete slab temperature varied from 39° F near the front doors to 64° F underneath the heaters.



E31-1202-64 / E31-1203 / E31-1202 / E31-1204 applied 1/7/10.

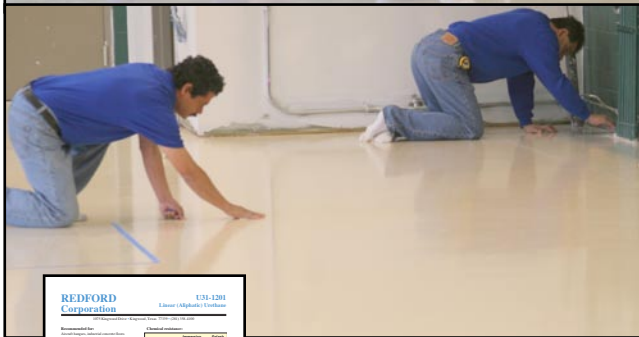


Christian Brothers Automotive

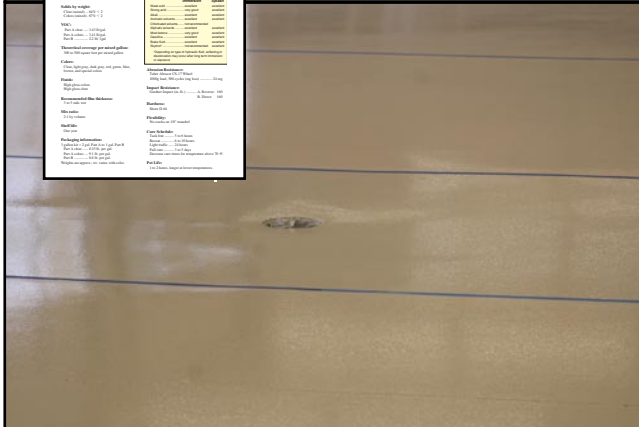
2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel



REDFORD Corporation		U31-1201
Urethane Topcoat		
Availability:	Available in all states.	
Application:	Hand-applied with brush or roller.	
Surface Preparation:	Surface must be clean, dry, and free of oil, grease, and wax. Light sanding is recommended.	
Application:	Apply in thin, even coats. Allow each coat to dry for 24 hours before applying the next coat.	
Recommended Mix Ratio:	1:1 (by volume)	
Storage:	Store in a cool, dry place. Shelf life is 12 months.	
Notes:	For more information, visit our website at www.redfordcorp.com .	



U31-1201 urethane topcoat applied.

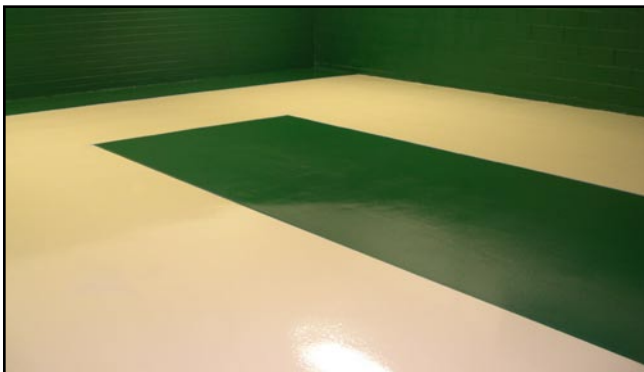


Christian Brothers Automotive

2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel



Floor completed at 10:00 P.M. on Saturday, January 9, 2010.

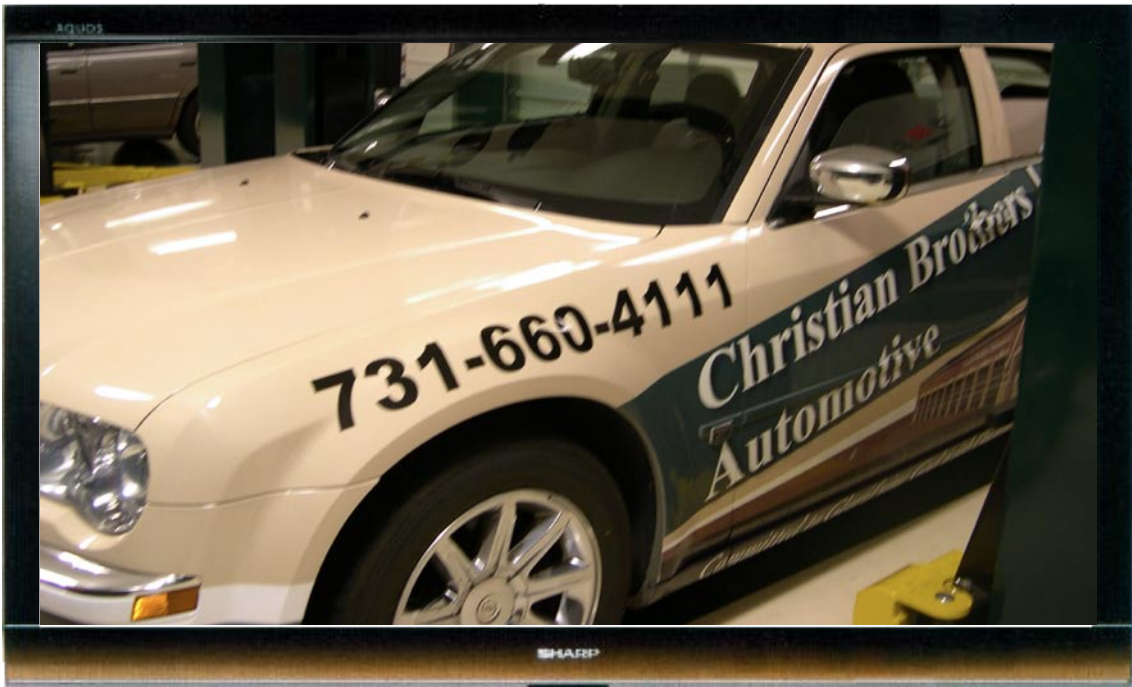
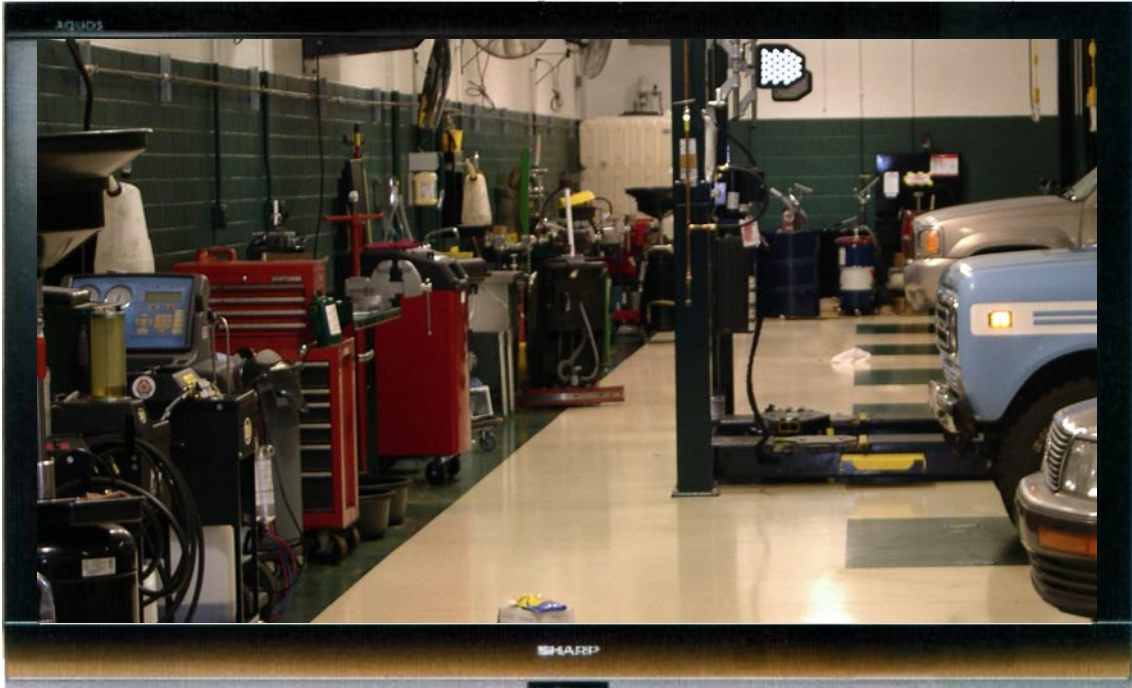


Christian Brothers Automotive

2700 Highland Ave.

Jackson, Tennessee 38305

Owners: Wes and Claire Pennel





Christian Brothers Automotive

2700 Highland Ave.
Jackson, Tennessee 38305
Owners: Wes and Claire Pennel

CBAC JACKSON

CASE HISTORY ADDENDUM 3/25

Summary from an inspection/repair trip made March 2010

Photos of various spot repairs made during that trip.





Christian Brothers Automotive

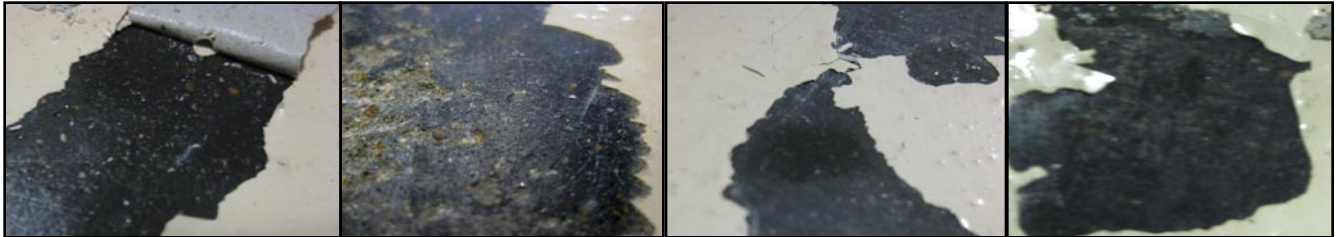
2700 Highland Ave.
 Jackson, Tennessee 38305
 Owners: Wes and Claire Pennel

CASE HISTORY ADDENDUM

Summary from an inspection/repair trip made April 2010

Diagnosis: The shop floor has cancer. The cancer is not curable, but it will go into remission for periods of time. It will be natural to now go through a blame process, remorse, and just plain frustration because of the floor cancer!

Figures 1-4



Figures 5-8



Summary: The shop floor was applied in one of the coldest temperature periods on record for Jackson, TN (where the subsoil was frozen). Now that the subsoil has thawed, the moisture is expanding and coming up the capillaries of the concrete in the form of osmosis (hydrostatic pressure). This is aggravated because the concrete was poured without a moisture vapor barrier. The photographs in Figures 1 – 4 show the moisture (as evidenced by the black concrete) when the coating is scrapped back.

The floor moisture “pushing” the coating off the floor will increase and be pronounced more in hot summer months as the moisture tries to escape from beneath the concrete (which it cannot do under the highly, cross-linked dense urethane coating system). The shop floor will go into “remission” during colder months, but “flare up” again in warmer months. All the postulating, scientific testing, blame, and discussions cannot solve the problem now. To correct the Jackson shop floor “cancer”, the floor will have to be jack hammered out, a vapor barrier installed, and new concrete poured to guarantee 100% success (and the coating system applied in warm, dry, conditions!).

Recommendations going forward: Since it would be an extreme and impractical solution to jack hammer out the floor, install a vapor barrier and repour the concrete, we recommend spot repairing the floor as needed on a regular basis. We will shortly be preparing and sending small, usable (practical) repair kits packaged in the correct 2:1 ratio with a written procedure outlining the repairs that will need to be made on an ongoing basis. We will recommend the repair of damaged spots at least every couple of weeks to determine after a period of time if this will be practical.

This is the only practical solution that we can think of to maintain the floor with a presentable appearance.