



INDIANA GEOLOGICAL SURVEY

611 N. Walnut Grove Ave., Bloomington, IN 47405-2208 · (812) 855-7636
<http://igs.indiana.edu> · IGSinfo@indiana.edu

July 23, 2015

Tim Sproull

Indiana Limestone Company

The Indiana Geological Survey performed standard ASTM test C97 Absorption and Bulk Specific Gravity, C99 Modulus of Rupture, C170 Compressive Strength, C241 Abrasion Resistance of Stone Subjected to Foot Traffic, and C880 Flexural Strength of Dimension Stone on specimens of stone known as Salem Limestone originating from the Indiana Limestone Company Central (Victor) quarry. Analysis of stone in this report was completed on July 23 2015. The results are included below.

C99, C170, and C880 specimens were tested with a model 60 BTE Baldwin-Satec hydraulic press using the required fixtures and ASTM procedures for these tests. Standard ASTM E4 is used to calibrate this press on a yearly basis. The required balance and water bath were used for ASTM C-97 specimens. The accuracy of load values for test specimens was +/- 0.5% for C99, C170, and C880.

Sincerely,

Drew M. Packman

Materials Testing Facility Coordinator

Indiana Geological Survey



INDIANA UNIVERSITY



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BUFF

C97 – Absorption and Bulk Specific Gravity

| | Absorption (%) | Bulk Specific Gravity |
|-----|----------------|-----------------------|
| 001 | 4.91 | 2.27 |
| 002 | 4.79 | 2.28 |
| 003 | 4.84 | 2.27 |
| | AVG=4.84 | AVG= 2.27 |
| | Low=4.79 | Low= 2.27 |
| | High=4.91 | High= 2.28 |

C99 – Modulus of Rupture

| | Wet Perpendicular (psi) |
|-----|-------------------------|
| 004 | 663 |
| 005 | 712 |
| 006 | 609 |
| 007 | 634 |
| 008 | 648 |
| AVG | 653 |
| | Wet Parallel (psi) |
| 009 | 704 |
| 010 | 744 |
| 011 | 764 |
| 012 | 658 |
| 013 | 763 |
| AVG | 727 |
| | Dry Perpendicular (psi) |
| 014 | 776 |
| 015 | 806 |
| 016 | 832 |
| 017 | 797 |
| 018 | 1004 |
| AVG | 843 |
| | Dry Parallel (psi) |
| 019 | 809 |
| 020 | 776 |
| 021 | 794 |
| 022 | 743 |
| 023 | 801 |
| AVG | 784 |





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C170 – Compressive Strength

Wet Perpendicular (psi)

| | |
|-----|------|
| 024 | 6317 |
| 025 | 4612 |
| 026 | 6745 |
| 027 | 5527 |
| 028 | 5476 |
| AVG | 5735 |

Wet Parallel (psi)

| | |
|-----|------|
| 029 | 4257 |
| 030 | 4423 |
| 031 | 6243 |
| 032 | 3396 |
| 033 | 5150 |
| AVG | 4693 |

Dry Perpendicular (psi)

| | |
|-----|------|
| 034 | 4325 |
| 035 | 7615 |
| 036 | 7261 |
| 037 | 7083 |
| 038 | 6622 |
| AVG | 6581 |

Dry Parallel (psi)

| | |
|-----|------|
| 039 | 6552 |
| 040 | 3155 |
| 041 | 6366 |
| 042 | 6184 |
| 043 | 6972 |
| AVG | 5845 |

C241 – Abrasion Resistance to Foot Traffic

Dry Perpendicular (%)

| | |
|-----|-----|
| 047 | 6.7 |
| 048 | 7.2 |
| 049 | 7.1 |
| AVG | 7.0 |

Dry Parallel (%)

| | |
|-----|-----|
| 044 | 7.0 |
| 045 | 7.1 |
| 046 | 7.2 |
| AVG | 7.1 |





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C880 – Flexural Strength

| | Wet Perpendicular (psi) |
|-----|-------------------------|
| 050 | 462 |
| 051 | 611 |
| 052 | 489 |
| 053 | 564 |
| 054 | 598 |
| AVG | 544 |

| | Wet Parallel (psi) |
|-----|--------------------|
| 055 | 562 |
| 056 | 555 |
| 057 | 577 |
| 058 | 521 |
| 059 | 569 |
| AVG | 556 |

| | Dry Perpendicular (psi) |
|-----|-------------------------|
| 060 | 745 |
| 061 | 702 |
| 062 | 562 |
| 063 | 728 |
| 064 | 816 |
| AVG | 716 |

| | Dry Parallel (psi) |
|-----|--------------------|
| 065 | 682 |
| 066 | 661 |
| 067 | 708 |
| 068 | 791 |
| 069 | 692 |
| AVG | 706 |





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GRAY

C97 –Absorption and Bulk Specific Gravity

| | Absorption (%) | Bulk Specific Gravity |
|-----|----------------|-----------------------|
| 001 | 4.62 | 2.31 |
| 002 | 4.57 | 2.32 |
| 003 | 4.60 | 2.32 |
| | AVG=4.60 | AVG= 2.32 |
| | Low=4.57 | Low= 2.32 |
| | High=4.62 | High= 2.32 |

C99 – Modulus of Rupture

| | Wet Perpendicular (psi) |
|-----|-------------------------|
| 004 | 819 |
| 005 | 808 |
| 006 | 816 |
| 007 | 769 |
| 008 | 752 |
| AVG | 793 |
| | Wet Parallel (psi) |
| 009 | 729 |
| 010 | 814 |
| 011 | 778 |
| 012 | 747 |
| 013 | 750 |
| AVG | 764 |
| | Dry Perpendicular (psi) |
| 014 | 966 |
| 015 | 932 |
| 016 | 859 |
| 017 | 857 |
| 018 | 867 |
| AVG | 793 |
| | Dry Parallel (psi) |
| 019 | 940 |
| 020 | 943 |
| 021 | 946 |
| 022 | 913 |
| 023 | 871 |
| AVG | 922 |





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C170 – Compressive Strength

| | Wet Perpendicular (psi) |
|-----|-------------------------|
| 024 | 6254 |
| 025 | 5962 |
| 026 | 5677 |
| 027 | 5410 |
| 028 | 5009 |
| AVG | 5662 |

| | Wet Parallel (psi) |
|-----|--------------------|
| 029 | 4230 |
| 030 | 4339 |
| 031 | 3995 |
| 032 | 3862 |
| 033 | 3649 |
| AVG | 4015 |

| | Dry Perpendicular (psi) |
|-----|-------------------------|
| 034 | 6431 |
| 035 | 7550 |
| 036 | 4763 |
| 037 | 7115 |
| 038 | 7060 |
| AVG | 6583 |

| | Dry Parallel (psi) |
|-----|--------------------|
| 039 | 5414 |
| 040 | 6297 |
| 041 | 5969 |
| 042 | 4801 |
| 043 | 3892 |
| AVG | 5274 |

C241 – Abrasion Resistance to Foot Traffic

| | Dry Perpendicular (%) |
|-----|-----------------------|
| 047 | 10.1 |
| 048 | 10.6 |
| 049 | 10.5 |
| AVG | 10.4 |

| | Dry Parallel (%) |
|-----|------------------|
| 044 | 8.5 |
| 045 | 9.0 |
| 046 | 8.7 |
| AVG | 8.7 |





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C880 – Flexural Strength

| | | |
|-----|-------------------------|--|
| | Wet Perpendicular (psi) | |
| 050 | 648 | |
| 051 | 573 | |
| 052 | 552 | |
| 053 | 548 | |
| 054 | 605 | |
| AVG | 585 | |
| | Wet Parallel (psi) | |
| 055 | 614 | |
| 056 | 635 | |
| 057 | 539 | |
| 058 | 589 | |
| 059 | 579 | |
| AVG | 591 | |
| | Dry Perpendicular (psi) | |
| 060 | 672 | |
| 061 | 648 | |
| 062 | 616 | |
| 063 | 683 | |
| 064 | 727 | |
| AVG | 669 | |
| | Dry Parallel (psi) | |
| 065 | 844 | |
| 066 | 800 | |
| 067 | 838 | |
| 068 | 745 | |
| 069 | 742 | |
| AVG | 793 | |

